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BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY

AFFILIATED WITH
LAWRENCE COLLEGE
APPLETON, WISCONSIN

LIBRARY NOTES

JANUARY · 1951
Volume 21 Number 5

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Books and Pamphlets Added to the Library During December

CHEMISTRY, ANALYTIC

ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS. Official methods of analysis. Editorial Board, Henry A. Lepper, chairman. 7th ed. Washington, The Association, 1950. 910 p.

CHEMISTRY, ORGANIC—SYNTHESIS

BILLMAN, JOHN H., and CLELAND, ELIZABETH S. Methods of synthesis in organic chemistry. [2d ed. Bloomington, Ind., The Authors, c1950] 229 p.

COLLOIDS

ALEXANDER, JEROME, coll. and ed. Colloid chemistry, theoretical and applied, by selected international contributors. Vol. VII. Theory and methods; biology and medicine; technological applications. New York, Reinhold, 1950. 736 p.

CONTAINERS

BOXBOARD CONTAINERS, formerly Shears, established 1892. October, 1950. [Chicago, Haywood Publ. Co.] 1950. 276 p.

ERSTER deutscher Verpackungskatalog. Berlin, Die Neue Verpackung, Gebr. Weiss Verlag, 1950. 260 p.

MODERN PACKAGING encyclopedia, 1951. New York, Packaging Catalog Corp., c1950. 945 p.

ELECTROLYTES

HARNED, HERBERT S., and OWEN, BENTON B. The physical chemistry of electrolytic solutions. 2d ed., rev. and enl. New York, Reinhold, 1950. 645 p.

HOUSE ORGANS

THE PRINTERS' INK directory of house organs. [3d ed.] New York, Printers' Ink Publ. Co., Inc., c1950. 163 p.

INSURANCE, SOCIAL

MERIAM, LEWIS, and SCHLOTTERBECK, KARL. The cost and financing of social security, with a chapter on veterans' benefits by Mildred Maroney. Washington, The Brookings Institution, 1950. 193 p.

IONS—MIGRATION AND VELOCITY

KUNIN, ROBERT, and MYERS, ROBERT J. Ion exchange resins. New York, Wiley [c1950] 212 p.

PAPER MAKING AND TRADE—HISTORY

THE GARDNER BOARD AND CARTON COMPANY. This is Gardner. Fiftieth anniversary, 1900-1950. Middletown, Ohio, The Company [c1950] 64 p.

PLASTIC MATERIALS

KLINE, GORDON M. Plastics research and technology at the National Bureau of Standards; a review and bibliography. National Bureau of Standards circular 494. Washington, U. S. Govt. Print. Off., 1950. 14 p.

SOUND—RECORDING AND REPRODUCING

BEGUN, S. J. Magnetic recording. New York, Murray Hill Books, Inc. [c1949] 242 p.

TRADE DIRECTORIES

NATIONAL DIRECTORY of the Canadian pulp and paper industries, 1950. J. N. Stephenson, editor. Gardenvale, Que., National Business Publications Limited, 1950. 492 p.

UNITED STATES—ECONOMIC CONDITIONS

MOULTON, HAROLD G., and PALMER, FRANK. The dynamic economy; a dialogue in play form. Washington, The Brookings Institution, 1950. 238 p.

WATER—POLLUTION

PROCEEDINGS of the Second Industrial Waste Conference held at Purdue University, January 10-11, 1946. Purdue University Engineering Bulletin. Extension series no. 60. Lafayette, Ind., The University, Department of Engineering Extension [1946] 183 p.

PROCEEDINGS of the Fourth Industrial Waste Conference held at Purdue University, September 21-22, 1948. Sponsors: School of Civil Engineering and Technical Extension Division, Purdue University, Lafayette, Indiana, and Division of Sanitary Engineering, Indiana State Board of Health, Indianapolis, Indiana. Purdue University Engineering Bulletin. Extension series no. 68. Lafayette, Ind., The University, The Engineering Extension Department [1949] 327 p.

PROCEEDINGS of the Fifth Industrial Waste Conference held at Purdue University, November 29-30, 1949. Sponsors: School of Civil Engineering and Technical Extension Division, Purdue University, Lafayette, Indiana, and Division of Sanitary Engineering, Indiana State Board of Health, Indianapolis, Indiana. Purdue University Engineering Bulletin. Extension series no. 72. Lafayette, Ind., The University [Engineering Extension Department, 1950] 431 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ACID PLANT

BARKER, E. R., JR. Sulfite acid preparation. Paper Trade J. 131, no. 22: 136, 138, 140-2 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 1 table, 5 figures, and 1 reference. E.S.

DARRAH, JOHN C. The preparation of sulfur dioxide. Paper Trade J. 131, no. 22: 131-5 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 5 figures and 5 references. E.S.

LUNDBERG, A. H. Sulfur dioxide recovery. Paper Trade J. 131, no. 22: 147-51 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 5 tables, 3 figures, 1 flowsheet, and 11 references. E.S.

SNYDER, J. H. Sulfite acid making. Paper Trade J. 131, no. 22: 142, 144, 146-7 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 2 figures. E.S.

AKALINE PROCESSES

ABELE, WILH. The concept of productivity in American paper and pulp mills. Wochbl. Papierfabr. 78, no. 20: 598-9 (Oct. 31, 1950). [In German]

Following a brief reference to the mechanization, particularly of materials handling, in American mills, the author mentions the important part played by unbleached and bleached sulfate in new projects and the many applications of sulfate papers and boards. He emphasizes the need for correction in the use of the term "soda pulp (Natronzellstoff)" in the German technical press which still fails to make the proper differentiation between soda and sulfate pulps and papers, thereby causing unnecessary confusion. Although Germany has no important sulfate industry of her own, enough should be known about the process to make correct reference to the product whenever it is involved. E.S.

BECKLER, WARREN, JR. Kraft pulping. Paper Trade J. 131, no. 22: 164-71 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 1 table and 2 flowsheets. E.S.

CARLIN, T. J. Kraft pulping. Paper Trade J. 131, no. 22: 171-2, 174, 177-8 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 1 table, 2 figures, and 2 flowsheets. E.S.

KEITH, EDWARD W. The soda process. Paper Trade J. 131, no. 22: 178-83 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 4 figures and 1 flowsheet. E.S.

WERNER, T. H. Caustic pulping—the soda process. Paper Trade J. 131, no. 22: 158-63 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

AKALINE PROCESSES—FURNACES

ANON. Australians put new wrinkle in black liquor recovery. Chem. Eng. 57, no. 12: 215 (December, 1950).

The conventional cylindrical holes between firebricks in the walls of black liquor recovery furnaces (which wear rapidly) have been replaced by lance-hole blocks of monolithic soapstone construction which exhibit excellent erosion resistance and are easily replaced. E.S.

ROBERTS, FRANK W. The evolution of the modern recovery unit for soda and sulfate pulp mills. Paper Trade J. 131, no. 22: 191-4, 196-200, 202 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 11 figures. E.S.

ALKALINE PROCESSES—RECOVERY

WILLINS, LINWOOD G. Chemical recovery operations in the soda and sulfate mill. Paper Trade J. 131, no. 22: 183-4, 186-9, 191 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 2 tables and 4 figures. E.S.

ALUM

CHEMICAL ENGINEERING. Alum. Chem. Eng. 57, no. 12: 172-5 (December, 1950).

The process of producing alum by treating bauxite with sulfuric acid is described by means of a pictured flowsheet. 1 flowsheet and 11 illustrations. M.W.

ASSOCIATIONS

ANON. The Technical Section of the British Paper & Board Makers Association. Indian Pulp and Paper 5, no. 3: 164 (September, 1950).

A brief outline of the activities of the section is given. E.S.

MACDONALD, R. G. The stewardship of a local section. Tappi 33,

no. 12: 98-9A (December, 1950); Southern Pulp Paper Manuf. 13, no. 12: 18, 20, 22 (December, 1950).

Commemorating the 15th anniversary of the Ohio Section of TAPPI, a brief outline of the history of its foundation is given. The relationship between the local sections and the national organization is discussed, particularly with regard to what the sections can do to bridge the gap between the individual members and the parent association. E.S.

BARKERS AND BARKING

STOECKLER, J. H. Pulpwood preparation in Scandinavia. Paper Ind. 32, no. 9: 971 (December, 1950).

The advantages of peeling pulpwood and sawlogs in the forest, a Scandinavian practice, are discussed, including reduction of decay through partial drying, less loss by sinkage in the floating of logs, and reduction of transportation cost in rail shipments. Peeled aspen and birch have been successfully stored for as much as three years in pulpwood piles, with practically no loss from rot. On the other hand, unpeeled wood of these species can be held in storage for only about one or two years at the most; one year is usually the practicable time limit for storage without considerable deterioration. E.S.

WILÉN, ROLF. Barking and the use of bark as fuel. Paper and Timber (Finland) 32, no. 11: 352-3 (November, 1950). [In Swedish]

The economic advantages of pressing bark, drying it to about 60-70% ovendry, and using it as fuel in Finland are shown in several calculations. 1 diagram. E.S.

BEATING

BERGMAN, STUART I., and JOHNSON, MARIAN M. The proportion of water-accessible and nonaccessible cellulose in wood pulps as affected by beating. Tappi 33, no. 12: 586-7 (December, 1950).

A study of the effect of beating indicates that either no changes in the ratio of the accessible to nonaccessible cellulose in wood pulps result upon beating or that, if such changes do occur, they are masked by the variations inherent in the procedure used (moisture-regain values). 5 tables and 4 references. E.S.

SCHELHORN, F. B. Stock preparation—beating and refining. Paper Trade J. 131, no. 22: 235-6, 238, 240, 242 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 9 figures. E.S.

WILSON, G. E. Control of chemicals in the beater room. Pulp Paper Mag. Can. 51, no. 12: 126, 129 (November, 1950).

The author discusses methods of adding the most commonly applied materials to the beater for maximum efficiency in use, including rosin size, alum, clay, and starch, with brief reference to summer-sizing troubles. In the author's mill, these have been successfully overcome by using an excess of alum and furnish water to which five pounds of soda ash per beater had been added for neutralizing this excess. Extremely good sizing results have been obtained by this technique which has been used with the same success on subsequent occasions. E.S.

BENTONITE

MOTOYOSHI, MASANOBU. Use of active clay in the paper industry. J. Japan. Tech. Assoc. Pulp Paper Ind. 4, no. 5: 2-9, 78 (October, 1950). [In Japanese; English summary]

It is shown that loading and sizing effects can be obtained by the use of bentonite alone. When bentonite is added to a rosin size, the degree of sizing, stability, and firmness of the size are increased; these improvements result from the lyophilic colloidal properties of the clay. The decrease in sizing which accompanies steam drying can be prevented to a certain extent by the incorporation of an acid clay; the sizing is liable to be mottled, however. 6 tables, 8 figures, and 13 references. E.G.S.

BLACK LIQUOR

CLARE, K. E., and SHERWOOD, P. T. Separation of the organic constituent of black liquor. J. Soc. Chem. Ind. (London) 69, no. 6: 192 (June, 1950).

A study of means for the separation of the organic constitutents of black liquor was made as part of a research project carried on by the Road Research Laboratory on substitute materials for road construction. The separation of lignin in black liquor by passing carbon dioxide through it is not successful with the liquor obtained from esparto grass because of the colloidal nature of the precipitate. Acidification of the liquor with hydrochloric acid is also unsuccessful unless an excess of calcium chloride is added first. A study was then made of the optimum conditions for filtration. With liquor which contained 50% solids, the most satisfactory results were obtained by dilution with an equal quantity of water and addition of one quarter of the total volume of 25% calcium chloride solution and 1½ volumes of 4 *N* hydrochloric acid. The composition of the material isolated in this way corresponds to that of a calcium derivative of lignin or polyuronides which have two organic residues of average molecular weight of 2000 attached to each calcium atom. 2 tables and 1 reference. M.W.

BLEACHING

BUFFALO ELECTRO-CHEMICAL COMPANY. New pulp bleaching technique. Chem. Eng. 57, no. 12: 112 (December, 1950); *cf.* B.I.P.C. 21: 79.

A brief summary of the hydrogen peroxide cold-steep process of bleaching is given, and the advantages of the process are outlined. They include: a better product, adaptability, equipment savings, and simplicity. 1 table and 1 illustration. M.W.

MEHTA, R. M. Multi-stage bleaching of paper pulps. Indian Pulp and Paper 5, no. 3: 147-9 (September, 1950).

A brief account of multistage bleaching as applied to the treatment of paper pulps is given. 5 references. M.W.

PARSONS, JOHN L. Chlorine bleaching of chemical pulp. Paper Trade J. 131, no. 22: 216-17, 220-2 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 3 tables, 2 figures, and 1 reference. E.S.

PHILLIPS, NOEL R. Preparation of chlorine bleach liquors for

paper pulp. Paper Trade J. 131, no. 22: 211-12, 214 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 1 table and 6 references. E.S.

BLEACHING—GROUNDWOOD

COR. The bleaching of groundwood pulp. Wochbl. Papierfabr. 78, no. 18: 543-4 (Sept. 30, 1950). [In German]

A comparison (based on laboratory experiments) is made of the cost and efficiency of groundwood bleaching with sodium bisulfite and zinc hydrosulfite. The higher cost of the latter is offset by its more rapid action and greater flexibility of operation. E.S.

E. I. DU PONT DE NEMOURS & COMPANY. *Electrochemical Department.* Peroxide-bleached groundwood bright enough for use in higher quality papers. Chem. Processing 13, no. 12: 8-9, 17 (December, 1950).

A brief outline of the groundwood bleaching process with Solozone (sodium peroxide) or Albone (hydrogen peroxide) is given. 1 flowsheet and 1 illustration. E.S.

JOHANSSON, O. S. The bleaching of Swedish spruce groundwood pulp with sodium peroxide. Svensk Papperstidn. 53, no. 20: 649-53 (Oct. 31, 1950). [In Swedish; English and German summaries]

Swedish spruce groundwood was bleached with sodium peroxide on a laboratory scale; the statements given in the American literature were, in general, confirmed. The maximum increase in brightness was obtained with a bleach liquor containing sodium peroxide, 41.5°Bé. sodium silicate, and sulfuric acid in the ratio of 20:50:17; this liquor had a pH of approximately 11.5. The effects of pH, amount of peroxide, pulp consistency, temperature, reaction time, and certain preliminary treatments of the pulp were investigated. Under the most favorable conditions, 3% sodium peroxide (based on ovendry pulp) increased the brightness of a handmade sheet 11-14 points G.E. The optimum pulp consistency was found to be 10-20% and the most favorable temperature about 40°C. The reaction period required for reaching the maximum brightness under these conditions was about two hours. A preliminary treatment of the pulp with small quantities of sulfur dioxide at a pH of approximately 4 resulted in an additional increase in brightness of 2-3 points G.E. A comparison was made with zinc hydrosulfite as the bleaching agent for groundwood pulp; however, the resulting increase in brightness was only about 3 points G.E. 6 figures and 8 references. E.S.

PIERCE, L. A. Peroxide bleaching. Paper Trade J. 131, no. 22: 203-4, 206, 208, 211 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 2 tables, 2 figures, and 2 references. E.S.

RITTENHOUSE, GEORGE V. Groundwood bleaching with zinc hydrosulphite. Tappi 33, no. 12: 105-6A (December, 1950).

The zinc hydrosulfite process of groundwood bleaching as developed by the Virginia Smelting Co. is outlined, and its efficiency is compared with that of the peroxide bleaching procedure. 3 tables. E.S.

BLEACHING—SULFATE

CASCIANI, FERRI, and STORIN, GORDON K. Chlorine dioxide and alkaline peroxide in kraft bleaching. Tappi 33, no. 12: 588-94 (December, 1950).

A comparison is made of the effect of acidified sodium chlorite, chlorine dioxide, alkaline peroxide, and calcium hypochlorite solutions as final bleaching agents for a southern pine kraft pulp preliminarily bleached by the conventional chlorination-extraction-hypochlorite method. The bleached pulps are compared chiefly from the standpoint of viscosity, strength, and brightness permanence. The merits and limitations of each of these bleaching agents are pointed out. A new process is suggested for arriving at a bleached product of improved properties by the use of these chemical compounds in proper sequence. Observations are also reported on the relationship between the strength of bleached pulp and its cuprammonium viscosity. 16 tables, 2 figures, and 12 references. E.S.

BOARD

HUESTIS, C. S. Coarse papers—board, containers, etc. Paper Trade J. 131, no. 22: 299-300, 302, 304-6 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 2 tables and 2 figures. E.S.

BOARD, INSULATING

SCHWARTZ, SIDNEY L. Insulating board from Douglas fir and alder. Paper Ind. 32, no. 9: 974-6 (December, 1950).

Fiberized Douglas-fir chips (old and second-growth, steamed and unsteamed), with and without the addition of neutral sodium sulfite semichemical alder pulp were converted into insulating boards and pulp sheets. The procedures for cooking, milling in a double-rotating disk refiner, and board making are described. Data on the properties of insulating board and pulp test sheets are presented in tabular form. In general, Douglas-fir stock was enhanced by the addition of alder pulp, although this did not improve the ratio of tensile strength to energy consumption. The quality of stocks from second-growth Douglas-fir was superior to that from old growth. The milling energy requirements for steam-cooked Douglas-fir were about half those for raw wood chips. 2 tables. L.E.W.

BOARD, LAMINATED

OTTINGER, LAWRENCE. Novoply. Chemurgic Digest 9, no. 12: 7-8 (December, 1950); *cf.* B.I.P.C. 20: 471.

Although the production of plywood allows a greater volume of useful product than that of sawtimber, there is still substantial waste in plywood manufacture. However, a product which utilizes wood waste has been developed by the use of the Fahrni process. This product, called Novopan in Europe and Novoply in this country, has two outer layers of very thin shavings with a high-resin impregnation. The core is made of hammer-milled chips of any kind or type of wood. Preliminary research indicates that the material will do anything that plywood will do as a core stock, is better than the conventional lumber cross-banded with veneers, and is much less expensive. A plant which is being established by the United States Plywood Corp. at Anderson, Calif., is due to begin operations about February, 1951. 1 illustration. M.W.

BOARD, MEDICATED

DYKSTRA, WALTER W. New techniques and developments in rodent control. Pest Control 18, no. 12: 9-10, 12, 14, 39 (December, 1950).

In a general review on new developments, actidione, a by-product of the manufacture of streptomycin, is mentioned; it is highly toxic to rats and shows promise of being an effective rodent repellent. One ounce in 3675 gallons of water (approximately 2 p.p.m.) caused rats to refuse to drink the solution even though they may have been dying of thirst. When the material is added to food, it is stated that the "rats prefer death after 11 days of starvation." Paperboard barriers impregnated with actidione resisted rodent penetration for periods up to 200 hours although untreated barriers were penetrated in 30 minutes. The annual production of actidione is five pounds, at a cost of approximately 300 dollars per pound. 2 figures. W.M.V.

BOARD MILLS

ANON. How boards are made. Paper & Print 23, no. 3: 311-12, 314 (Autumn, 1950).

A description is given of the A. B. Industripapp fiberboard mills at Gothenburg, Sweden. The manufacturing, coating, and packaging processes are discussed briefly. 6 illustrations. M.W.

BOARD MILLS—WASTE LIQUOR

AXE, EARL J. Paperboard mill white-water treatment. Proc. 3d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 64: 98-108 (November, 1947).

As a project sponsored by the Middle Atlantic Section of the Regional Committee of the National Council for Stream Improvement at Rutgers University, a survey of eight paperboard and three specialty mills was made to determine the processes producing the wastes, the characteristics of the wastes, and reductions in suspended solids and oxygen-demanding materials accomplished by the treatment and recovery devices commonly in use. For appraising the pollutional characteristics of the wastes, a study was made of the total pollution contributed by the mills, as well as of the various fractions of the discharged wastes. The results are discussed briefly. 1 table and 15 references. E.S.

GEHM, HARRY W. The importance of fundamental research in waste-treatment problems. Proc. 3d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 64: 61-4 (November, 1947).

Reference is made to possible improvements in the treatment of board-mill wastes resulting from the discovery that much of the organic matter present in news, chips, and waste-paperboard wastes (formerly believed to be in true solution) is actually in the dispersed phase. A method for segregating colloidal debris from sludge and water is suggested. 1 table and 1 figure. E.S.

KNACK, M. F. A waste-treatment plant for board-mill wastes. Proc. 4th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 68: 260-5 (July, 1949).

The author describes the program for closing the white-water system at the board mill (one strawboard and four paperboard machines) of the River

Raisin Paper Co., Monroe, Mich. The details of white-water re-use, the installation and operation of an Infilco Cyclator unit, and problems developing from the re-use of its sludge are discussed. On the basis of the rather brief experience of this mill (at the time the article was written), the operating results were generally satisfactory, although further changes may still be necessary. The economics of the system do not present an attractive picture if the Cyclator unit is considered alone; however, if the savings resulting from the recirculation of the white water are included, the whole project may at least become self-supporting. 1 table. E.S.

VOGLER, JOHN F., and RUDOLFS, WILLEM. Factors involved in the drainage of white-water sludge. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 305-15 (July, 1950).

The following factors are discussed: volume and consistency, side-wall effect, effect of initial solids concentration, depth of application, and chemical conditioning. Board-mill sludge was found to drain somewhat faster than digested sewage sludge. A lower solids concentration of board-mill sludge results in more rapid and complete drainage, drier cake, and easier handling. Depth of sludge application is not a factor in drainage unless rapid drainage is desired. In general, chemical conditioning with coagulants has little, if any, beneficial effect on drainage. Large doses of ferric sulfate decrease drainage time to some extent. 1 table, 6 figures, and 4 references. M.W.

BOARD SPECIALTIES

CHEMICAL INDUSTRIES. Damp strike. Chem. Inds. 67, no. 6: 877 (December, 1950).

Book matches recently developed by the Universal Match Corp. feature a water-resistant striking strip. The hydrophobic feature is a result of a carefully controlled chrome-tanning process on the glue used as an adhesive in the friction striking surface. Even after complete saturation, the striking surface will permit striking of the matches, and tests have shown that when subjected to 100% humidity for periods of six months, the strip did not deteriorate, soften, or show evidence of mold. 1 illustration. M.W.

BOARD TESTING—PHYSICAL

VAN DEN AKKER, J. A., and WINK, W. A. Instrumentation studies. LX. The Beach puncture tester. Tappi 33, no. 12: 114-22A (December, 1950); *cf.* B.I.P.C. 21: 259.

The Beach puncture tester, an instrument for measuring the work required to pierce a paperboard with a pyramidal point, has been investigated with regard to principles of method and design. Fundamental measurements of the instrumental constants and scales showed the latter to be accurate. Frictional losses were found to be small and of such nature as to be allowed for, with one exception: an appreciable loss resulted from the method of mounting of the auxiliary weights. A significant error was found in the displacement of the release mechanism when the auxiliary weights were added to the pendulum system. Strain-energy set up in the puncture arm was found to result in appreciable error. The effect of sharpness of the edges and point of the puncture head was investigated for a number of boards, and a consistent relationship between test results and sharpness was not found; this led to the conclusion that, whatever the ultimate significance of the instrumental reading, a difference between a pair of readings on different boards is not significant if less than several per cent. The influence

on test results of thin films of tacky and lubricating materials was measured, and it was found that the nature of the surface of a specimen could, under certain conditions, affect the puncture work quite materially; doubt is expressed that differences of this origin reflect the relative abilities of two boards to withstand puncturing force. The effect of varying the size and angular orientation of the triangular sample aperture was observed with a view to establishing manufacturing tolerances on these variables. Several suggestions for the improvement of the instrument are presented. 10 tables, 7 figures, and 10 references. E.S.

BONDED FIBER WEBS

ANON. Lace to laminates with bonded fabrics. Modern Ind. 20, no. 6: 68, 71 (December, 1950).

Bonded fabrics (textiles made without weaving) are competing with both paper and woven and knit fabrics for general plant use and in many specialized applications. Compared with paper, bonded fabrics are superior in appearance, absorption, strength, drape, and smoothness. They compete with woven and knit textiles on the basis of a lower price, and they have a smoother surface, can be made stretchy, and may be made heat sealing without the use of adhesives. The new textiles are inferior to woven fabrics in launderability, resistance to abrasion, all-over strength, and appearance. A series of uses for the nonwoven textiles is included. 5 illustrations. M.W.

CELLOPHANE

ANON. Why there's not enough cellophane. Du Pont Mag. 44, no. 6: 18 (December, 1950-January, 1951).

At present there is a diminished supply of Du Pont cellophane, which results from an increased use in conjunction with an unexpanded production. At the time that Du Pont planned to expand their plant capacity, they became involved in a litigation with the Department of Justice, which charged that the Du Pont cellophane business constituted a monopoly. They have been unable, therefore, to continue expansion plans, but instead have designed and are building a cellophane plant for Olin Industries, Inc. at Pisgah Forest, N.C., which will be in production by the middle of this year. 3 illustrations. M.W.

MINNESOTA MINING AND MANUFACTURING COMPANY. Double-coated tape. Chem. Inds. 67, no. 6: 918 (December, 1950).

Scotch brand double-coated cellophane tape No. 666 has a transparent pressure-sensitive adhesive on both sides. It is virtually transparent to x-radiation and does not fog or desensitize photographic plates. It adheres to paper, glass, wood, and metal surfaces. Several suggested uses for the product are listed. M.W.

CELLULOSE

DOUGLAS, IRWIN B. The chemistry of cellulose and wood. Paper Trade J. 131, no. 22: 99-100, 103-6 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 13 figures and 16 references. E.S.

HAPPEY, F. Some new concepts in the structure of cellulose and its derivatives. J. Textile Inst. 41, no. 10: T381-403 (October, 1950).

An outline is given of the results of work carried out on the structure of cellulose and its derivatives. The data which are presented are based chiefly

on x-ray and allied physical studies. The four concepts which were formed from the data are: (1) a modified theory of nitration, (2) a rationalization of the approach to the problem of acetylation and saponification, (3) a crystalline secondary acetate, the structure of which is based on isomorphic replacements in the lattice of triacetylcellulose II, and (4) an explanation of the possibility of nitrocellulose having a two-phase structure in the crystalline part, based on the known di- and trinitro lattices. 3 tables, 19 figures, and 51 references. M.W.

HEUSER, EMIL. Factors which influence the kinetics of cellulose reactions. Textile Research J. 20, no. 12: 828-37 (December, 1950).

An attempt has been made to show that the course of cellulose reactions in which the latter's hydroxyl groups are involved is governed by its physical structure (microscopic and submicroscopic) as well as by the chemical nature of its hydroxyl groups. It would seem that for reasons not yet always clearly understood either one or the other of the two factors predominates—i.e., the physical accessibility of the hydroxyl groups, as dependent upon the crystalline-to-amorphous ratio, or their intrinsic chemical reactivity, as dependent upon the position of the hydroxyl groups in the anhydroglucose units. Practically all cellulose reactions may be grouped into four main "possibilities." These are discussed and illustrated by concrete examples, such as oxidation with various agents, etherification and esterification, sorption of water, exchange with heavy water, the action of sodium metal in liquid ammonia, and various other reactions. 3 figures and 41 references. E.S.

CELLULOSE—DENSITY

HERMANS, P. H., and VERMAAS, D. Note on density determination of cellulose fibers by the flotation method in carbon tetrachloride. J. Polymer Sci. 5, no. 6: 734-5 (December, 1950); *cf.* B.I.P.C. 16: 494.

A source of error in the previous article concerning the flotation method in carbon tetrachloride for the density determination of cellulose fibers is pointed out. It was found that the fiber pellets used for the method frequently exhibited an acid reaction which caused irreproducible results. The acid contamination was traced to the presence of phosphorus pentoxide contaminated with minute amounts of phosphorus trioxide; the latter produced the acid reaction. A method of analysis of the pentoxide and a means of oxidizing the trioxide are presented. 2 references. M.W.

CELLULOSE—HOLOCELLULOSE

BISHOP, C. T., and ADAMS, G. A. Use of liquid ammonia in the fractionation of wheat straw holocellulose. Can. J. Research 28 B, no. 12: 753-61 (December, 1950).

Wheat straw holocellulose, after soaking in liquid ammonia for 36 hours at room temperature, was fractionated by successive extractions with cold water, 0.5% sodium carbonate, 0.5% potassium hydroxide, and 2.2% potassium hydroxide. Pretreatment with liquid ammonia increased the material soluble in cold water from 3 to 20.2%. Hemicellulose fractions were precipitated from the extracts by ethanol. A complete analytical balance was obtained by estimating ash, pentosan, uronic acid anhydride, acetyl, and methoxyl contents of the original holocellulose, of each of the fractions and of the residue. Analyses of the isolated fractions showed some systematic differences, with pentosan contents increasing and uronic acid anhydride decreasing progressively in the alkali-soluble fractions. D-Xylose, L-arabinose,

D-glucose, D-galactose, and hexuronic acid in approximate molar ratios of 40:7:2:1:4 were found in the hemicellulose fractions. The presence of the sugars was confirmed by isolation of crystalline derivatives. A uronic acid complex, resistant to hydrolysis, was isolated and the components shown to be D-xylose and a monomethoxygalacturonic acid. 2 tables, 1 figure, and 37 references. E.S.

CELLULOSE—OXYCELLULOSE

DAVIDSON, G. F. The acidic properties of cotton cellulose and derived oxycelluloses. Part VII. Ion-exchange reactions with basic dyes. J. Textile Inst. 41, no. 10: T361-80 (October, 1950); *cf.* B.I.P.C. 18: 658-61.

The affinities of the cations of a number of basic dyes for the carboxyl groups of acidic oxycelluloses have been compared by means of measurements of the absorption of dye cations in competition with the sodium ion or with another species of dye cation, and by means of chromatographic investigations of the displacement of dye cations from a combination with an oxycellulose by sodium ions. The basic dyes differ widely in affinity, but even the most weakly bound has a much greater affinity than the sodium ion. The exchange reactions studied do not obey the law of mass action, but conform to the equation $R = Kr^p$, where R and r are the ratios of the concentrations of the competing cations in the cellulose and solution phases respectively, K is a constant, and p is a constant less than unity. 10 tables, 8 figures, and 16 references. E.S.

CELLULOSE ESTERS—NITROCELLULOSE

GIZYCKI, J. F. v. The thermal decomposition of cellulose nitrates. Chem.-Ztg. 74, no. 43: 649-51 (Oct. 26, 1950). [In German]

Cellulose nitrates (I) decompose readily when heated at 100°C. The nitrogen dioxide (II) formed immediately oxidizes the cellulose with simultaneous reduction of (II) to nitric oxide, which in the presence of air is again oxidized to (II). The thermal decomposition of (I) begins with a depolymerization which cannot be stopped by chemical means. To prevent the secondary oxidation process of (I), substances may be added which react more readily with (II) than (I). Thus the addition of 1.5% diphenylamine increases the stability of (I) at 132° from 2.75 to 8 hours, that of 1.5% lignin to 6.75 hours, and that of 1.5% cork meal or pine bark to 5.75 hours. The decomposition is measured by the loss in weight. In the absence of air, the decomposition of (I) is considerably retarded. On prolonged heating of (I) the decomposition passes through various phases, during which the rate of degradation and the composition of the degradation products change. This may be the result of the different stability of the nitro groups. 2 tables, 3 figures, and 7 references. F.E.B.

CELLULOSE ETHERS

MCLAUGHLIN, R. R., and HERBST, J. H. E. The determination of the degree of substitution of carboxymethylcellulose over the entire substitution range. Can. J. Research 28 B, no. 11: 737-44 (November, 1950).

The published methods for the determination of the degree of substitution of carboxymethylcellulose were found to be unsatisfactory for samples of a high degree of substitution. Two methods were developed: one comprises the removal of the impurities from crude sodium carboxymethylcellulose by dialysis or washing with ethanol and determination of the sodium content;

the other is based on the precipitation of cupric carboxymethylcellulose under controlled conditions, purification, and determination of the copper content. 4 tables, 2 figures, and 10 references. E.S.

MCLAUGHLIN, R. R., and HERBST, J. H. E. The preparation of sodium carboxymethylcellulose. Can. J. Research 28 B, no. 11: 731-6 (November, 1950).

The preparation of sodium carboxymethylcellulose from cellulose, sodium hydroxide, and sodium chloroacetate in the presence of water was investigated. The effects of temperature, excess of sodium hydroxide, ratio of water to cellulose, time of mixing, and manner of addition of the reagents were studied. The highest degree of substitution attained was 2.8. 4 tables and 3 references. E.S.

CHEMICAL TESTING—CELLULOSE—ACCESSIBILITY

TARKOW, HAROLD. The accessibility of cellulose. Tappi 33, no. 12: 595-9 (December, 1950).

Sections of cellulose chains laid down in the cell wall occur in regions ranging from those having high lateral order, through regions of decreasing order, to regions of haphazard orientation. When produced by regeneration, the lateral order, at best, is low. Because of the gradual transition in lateral order, the term crystalline fraction is not a well-defined designation. Different methods for measuring crystallinity may give varying results, depending on how each method interprets the crystalline-noncrystalline pattern. Crystallinity as measured by x-ray diffraction is a measure of the fraction having at least a certain degree of lateral order. The method is direct. The method based on density determination is not an independent one, since it assumes that the ratio of the densities of crystalline and amorphous cellulose is the same as that of crystalline and amorphous butyl alcohol. The chain arrangement influences the course of cellulose reactions. The fraction of readily accessible material can be determined. It is questionable, however, whether the noncrystalline material is necessarily identical with the readily accessible material, since the reactivity may be influenced by additional factors. These include (1) degree of preswelling, (2) possibility of recrystallization, (3) size of reactant molecule, (4) presence of junction points, and (5) reactivity of surfaces of crystalline regions. The methods involving deuterium exchange, reaction with sodium, and analysis of adsorption isotherms give accessibility values which are in reasonable agreement. Recently a new method has been proposed, based on the ability of formic acid to react only with the primary hydroxyl group in the anhydroglucose residue. A relatively noncrystalline material like starch forms only a monoformate. Different celluloses acquire formyl contents less than that for a monoformate, with the values decreasing appreciably between that for rayons and that for native cellulose. The deviation from the monoformate is ascribed to the nonaccessibility of some of the primary groups. The ratio of the formyl content to that for a monoformate is assumed to be the fraction of readily accessible material. The values are in agreement with those obtained with the other nondestructive chemical methods. Accessibility determined by these chemical methods tells nothing about the absolute reactivity of the more difficultly accessible regions; therefore, such measurements by themselves do not characterize the chemical convertibility of a cellulose. 1 table, 7 figures, and 21 references. E.S.

CHEMICAL TESTING—CELLULOSE—FRACTIONATION

COPPICK, SIDNEY, BATTISTA, O. A., and LYTTON, M. R. Frac-

tionation of cellulose by summative method. Ind. Eng. Chem. 42, no. 12: 2533-8 (December, 1950).

Conventional stepwise precipitation or solution procedures for the measurement of the chain-length distribution of cellulose are time-consuming and require the use of a polymer-solvent system that is relatively inert or stable. In the case of cellulose all known solvents effect a chemical breakdown of the cellulose chains to some extent. It is for this reason that the fractionation of cellulose is usually performed on the cellulose nitrate derivative, using acetone as the stable solvent medium. The authors used a summative method for the fractionation of cellulose, whereby the time of polymer-solvent contact is held to a minimum. In this manner, attendant degradation is substantially reduced, and the accumulation of degradation products precluded. In practice, the summative method requires the use of a fresh aliquot of dissolved polymer to obtain each fraction. Summative cuts on these aliquots are made by means of fractional precipitation, and the fractions are recovered from the supernatant mother liquor after centrifuging. The summative distribution curve is obtained by plotting the percentage of material not precipitated against the corresponding weight average D.P. The mathematical interpretation of summative data is explained, and the conversion of summative distribution data to more common integral and differential distribution curves is illustrated. Although the merits of the summative method for the determination of the chain-length distribution of cellulose are emphasized, it is a procedure that lends itself to the fractional analysis of any high polymer-solvent system. The fractional analysis of the chain-length distributions of a typical viscose rayon, of rayons produced from pulps of known distribution, of rayons made from alkali cellulose crumbs aged for varying times, and of various rayon pulps has been carried out by the summative method using cold 8% sodium hydroxide as the solvent. Characteristic curves which show the weight-average differential distributions for these samples are included. 4 tables, 8 figures, and 21 references. E.S.

CHEMICAL TESTING—CELLULOSE ESTERS

GIZYCKI, J. F. v. The hydrolytic degradation of cellulose nitrates. Chem.-Ztg. 74, no. 44: 662-4 (Nov. 2, 1950). [In German]

The hydrolytic degradation of nitrocellulose during the manufacturing process may impair the technical quality of the product; highly depolymerized cellulose nitrates are not suitable for certain purposes. Reference is made to analytical methods for measuring the extent of the hydrolysis, including the determination of the viscosity curve at different stages of cooking the degraded cellulose nitrate in water according to P. Langmesser (unpublished data), for which the viscosity of the starting material need not be known, although the method is rather time-consuming; the determination of the solubility in 94% alcohol by extraction, which can be used only for comparing nitrates of identical type or at least of known raw materials; and Weber's methylene blue method for determining free carboxyl groups (*cf.* B.I.P.C. 12: 137-8) which, in a somewhat modified form, is applicable to cellulose esters. 4 figures and 4 references. E.S.

CHEMICAL TESTING—PULP—RETENTION OF BEATER ADDITIVES

SHRIVER, ELLSWORTH H., II, WEBB, H. M. B., and SWANSON, JOHN W. Methods for measuring the retention of polysaccharide beater additives. Tappi 33, no. 12: 579-86 (December, 1950).

Two new analytical techniques are described for the fundamental study of the retention of polysaccharide beater additives by pulps. One of these

methods makes use of the anthrone test for carbohydrates (which is more sensitive than iodine is for starch) combined with a Celite filtration method. The other technique employs a relationship between viscosity and concentration for many high polymers where the molecular distribution may be assumed constant. It is shown that these methods correlate very well but that slightly higher concentrations are obtained on samples measured by the anthrone technique as compared with the viscometric technique. These small differences, however, result in calculated sorptions for the viscosity technique which are about 1½ to 2 times those obtained with anthrone. This is probably caused by the lack of quantitative filtration of cellulose fines in the presence of the methylcellulose, which is a known deflocculating agent. The analytical variability was ascribed to the nonuniformity of pulp samples. 3 tables, 6 figures, and 13 references. E.S.

COLLOIDS

THODE, EDWARD F. Colloid technology in papermaking. Paper Trade J. 131, no. 22: 287-90 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

DE-INKING

PALLADINO, A. J. Design of a deinking waste-treatment plant. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 316-29 (July, 1950); *cf.* B.I.P.C. 19: 768-9.

The author presents details of the design of the deinking waste-treatment plant designed by the National Council for Stream Improvement for the Kalamazoo River Improvement Company. 2 tables and 2 figures. M.W.

DETECTORS (HIGH-FREQUENCY)

PHOTOBELL COMPANY, *New York*. High frequency current used to detect partially filled packages. Chem. Processing 13, no. 12: 54 (December, 1950).

Reference is made to a high frequency-current method for detecting empty or partially-filled containers made of paper, plastic, glass, wood, and similar nonconductors of electricity; it consists of passing a low-amplitude, high-frequency current through the package as it is carried on the conveyor. The amplitude of the current is a measure of the package fill; when this value indicates an empty package, the conveyor is automatically stopped. The contents of the package can be a liquid, solid, or powder, and must have certain electrical properties to aid the passage of the high-frequency current. The sensitivity can be adjusted to indicate partially filled, empty, and nonuniform packages. E.S.

DRYING—PAPER

DANIELL, WARREN F. The drying of paper. Paper Trade J. 131, no. 22: 278-9 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 1 table. E.S.

MURDOCK, HAROLD R. Industrial wastes. Ind. Eng. Chem. 42, no. 12: 81-2A (December, 1950).

As an example of an intangible expense item in chemical process indus-

tries, the author discusses the loss of heat in the process when air and water are employed as heat carriers. The use of air in drying paper on the machine is given as an illustration, although the basic idea is applicable to many other processes. The installation of a hood, the importance of a correct hood design for maximum economy, the correct use of exhaust fans and stacks, automatic control of machine exhaust, and the recovery of heat from the exhaust air, for instance in a Briner economizer, are described as means for tangible savings. 1 table. E.S.

DYES AND DYEING

CRAIG, F. A. Practical paper making. No. 5. The colouring of paper. Paper & Print 23, no. 3: 274-6, 278, 281 (Autumn, 1950); *cf.* B.I.P.C. 20: 885.

A general discussion concerning the coloring of paper is given. The various dyes used for this purpose are mentioned, and their properties and applications are summarized in a table. The process of coloring in the beater, paper defects, and color measurement are also considered. 1 table and 1 diagram. M.W.

LIPS, H. A. Two-sidedness of colored paper. Tappi 33, no. 12: 603-8 (December, 1950).

Two-sidedness is one of the oldest problems facing a mill manufacturing colored paper. Colored pigments always produce two-sidedness except when run on a slow machine. The color is sucked away from the wire side of the sheet leaving the felt side more heavily colored. Most soluble dyes also tend to produce two-sidedness. These dyes generally have a greater affinity for the fines than they do for the long fibers. The fines behave the same as colored pigments and are concentrated on the top surface; they are chemically different from the long fibers and have a greater surface area per unit of weight. Two-sidedness can be minimized by careful color selection. Vat dyes used in the reduced form produce non-two-sided sheets on sulfite pulp. Basic dyes on unbleached pulps and on groundwood are generally non-two-sided. Two-sidedness with acid and direct dyes may be improved by the control of the order and time of addition to the beater and with the aid of chemical dyeing assistants. Two-sidedness can be minimized by tinting the wire side of the sheet. Loaded papers represent a special problem of two-sidedness and are considered beyond the scope of this paper. 2 tables and 14 references. E.S.

SODERBERG, F. A. Color engineering. Paper Trade J. 131, no. 22: 250, 253, 255-6 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 2 figures. E.S.

ECONOMICS, INDUSTRIAL

RUMPF, A. NEWELL. A banker looks at the pulp and paper industry. Tappi 33, no. 12: 14A, 16A, 18A, 20A, 22A (December, 1950).

The author points out that a banker has a commodity for sale, as do the pulp and paper mills. His commodity is credit which he calls "the most vital fluid in our economic machine." Commercial bank loans were made to industry with a maturity beyond one year until the last decade. It is not unusual at the present time to negotiate loans up to seven years. Banks determine good loan risks on the basis of: (1) character and ability of

management; (2) financial factors; (3) operations-earning record; and (4) prospects for continuing in an earning position. With stocks representing between 15 and 20% of current over-all new financing in the paper industry, venture capital is fast becoming a minor factor. Since extension of debt was the ruination of more than one company in the last 50 years, the author urges a restoration of a safe capital structure by the sale of more common stock at lower prices. R.S.

FIBER—STRUCTURE

HESS, KURT. Electron microscopy and wall structure of native cellulose fibers. Kunstseide u. Zellwolle 28, no. 9: 339-47 (September, 1950). [In German]

Following a brief discussion of older German studies, in which the existence of fine fibrils in the cellulose wall was established, recent improvements (particularly foreign advances since 1944) are reviewed, which have become possible through improved methods of sample preparation, such as shadow casting. In conclusion, reference is made to certain still unsolved problems, particularly the determination of the dimensions, the shapes of cross sections, and the inner structure of the fine fibrils. The importance of the noncellulosic constituents for the preparation of samples is also mentioned (*cf.* Hodge and Wardrop, B.I.P.C. 20: 561). 1 table, 17 electron micrographs, and 44 footnotes. E.S.

FINISHING ROOM

BANCROFT, ROBERT A. Finishing and converting. Paper Trade J. 131, no. 22: 290, 292, 294, 297-8 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 4 figures. E.S.

FLOCCULATION

HUBLEY, C. E., ROBERTSON, A. A., and MASON, S. G. Flocculation in suspensions of large particles. Can. J. Research 28 B, no. 12: 770-87 (December, 1950).

Based upon an assumed mechanism of particle aggregation by shear-induced interparticle collisions, a new method of studying flocculation in suspensions of large particles is described, and representative results obtained with cellulose-fiber suspensions are presented. The method consists in subjecting the suspension to a reproducible condition of shear motion and analyzing the fluctuations in optical transmission coefficient electronically. An approximate statistical theory is presented, on the basis of which a flocculation index appropriate to the method is proposed. The index is a function of both the number and size of the aggregates. The flocculation index was found to decrease with increasing rate of shear and decreasing fiber length. The effect of concentration and of additives was investigated. Alternative experimental techniques are outlined, and limitations to the present method are pointed out. 3 tables, 15 figures, and 16 references. E.S.

FORESTS AND FORESTRY

BEDARD, AVILA. Some facts relating to forests and forestry in Quebec. Pulp Paper Mag. Can. 51, no. 12: 142-4, 147 (November, 1950).

Information and statistical data on the physiography of the Quebec forests, the activities of the Forest Service and the Forest Protection Service (which

separated in 1924), the importance of the forests to Quebec's greatest manufacturing industry (pulp and paper), and forest research in the province are given. 6 illustrations. E.S.

SPEER, JULIUS. The limits of productivity of the forests in western Germany. Das Papier 4, no. 19/20: 384-8 (October, 1950). [In German]

The decisive factor in the pulp and paper industry of western Germany is the supply of raw materials. The domestic wood production cannot satisfy more than 50-70% of the demand; imports of foreign pulpwood are scarce. The possibilities of an extended utilization of waste wood, fuel wood, and beechwood are discussed. E.S.

GROUNDWOOD MILLS

TREMBLAY, MAURICE. Canada's smallest pulp mill. Can. Pulp Paper Ind. 3, no. 12: 12-13 (December, 1950).

Brief reference is made to the groundwood mill of the Thorold Pulp Co. on the Niagara Peninsula with a daily output of 10 tons, Canada's oldest and smallest privately owned mill; it is superintended by a woman. 2 illustrations. E.S.

GROUNDWOOD PULP

HUME, ROBERT M. Mechanical pulping. Paper Trade J. 131, no. 22: 121-2, 124-5 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

NIVISON, ROBERT, JR. The manufacture of mechanical pulp. Paper Trade J. 131, no. 22: 115-19, 121 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 1 table, 12 figures, and 1 flowsheet. E.S.

GUMS AND RESINS

TRUE, R. P., and SNOW, ALBERT G., JR. Gum flow from turpentine pines inoculated with the pitch-canker *Fusarium*. J. Forestry 47, no. 11: 894-9 (November, 1949); *cf.* B.I.P.C. 20: 286.

Experiments with the inoculation of fresh slash and longleaf pine turpentine faces with the fungus *Fusarium lateritium* f. *pini* for prolonging the flow of oleoresin showed that the period of commercially adequate gum flow (normally one week) can be increased to an average of five weeks for slash pine and three weeks for longleaf pine. Later rechipping and retreatment of the same faces prolonged adequate flow for an average of three weeks with slash pine and for usually not more than two weeks with longleaf pine. There is no known reason for the difference between the prolongation induced by the initial and by later treatments. The final decision on the safety and commercial usefulness of the fungus as a gum-flow stimulant must await the results of further investigations. 1 table, 4 figures, and 6 references. E.S.

HEATING (INFRARED)

KÖRNER, H. Infrared drying in the paper industry. Das Papier 4, no. 12: 257-8 (June, 1950). [In German]

Following a brief discussion of the advantages of infrared drying, applications in the paper and some industries are outlined, with particular reference to the radiators constructed in Germany by Firma Jonke. 3 figures. E.S.

HISTORY

KAZMEIER, A. W. St. John's Day, 1390 in Nuremberg; a contribution to the celebration of the founding of the town. Das Papier 4, no. 11: 210-11 (June, 1950). [In German]

Ulman Stromeir (as he calls himself in his diary) made the first paper on German soil on St. John's Day, 1390 in the "Gleismühle," originally a rye mill situated outside the limits of Nuremburg, which he converted into a paper mill, although he was at that time over 60 years old. He had learned to evaluate the significance of paper during his merchant travels to Italy and brought workmen and papermakers with him to help in the establishment of his new undertaking. He died in 1407 at the age of 78 years and his son and, later, his grandson inherited the mill which, however, ceased to make paper in the year 1463. 1 figure. E.S.

PICCARD, GERHARD, and SPORHAN-KREMPEL, LORE. The monastery of Salem and paper from Ravensburg before and after the Thirty Years' War. Das Papier 4, no. 11: 208-10 (June, 1950). [In German]

The archives of the monastery of Salem (now housed in Karlsruhe) contain the ledgers kept by the monastic offices since 1540; even at that time paper was purchased in Ravensburg, so that the entries offer a valuable record of paper prices, mills, papermakers, and watermarks of that period. In 1598, the price of one ream of paper was equal to that of one calf. In the 17th century, the shipping costs were exceedingly high and amounted to about one quarter of the value of the goods; paper was usually packed in wooden barrels. 8 footnotes and 5 figures. E.S.

VOORN, H. The history of the hollander. Papierwereld 4, no. 24: 437-9 (July 1, 1950); Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 27, no. 7-9: 37-8 (July-September, 1950). [In Dutch; abstract in English]

Reference is made to the first mention of the hollander in Serndam in Holland by Dr. Johann Becher in 1680, from which it is known that the hollander was invented prior to that date, but not exactly when, where, or by whom. The Dutch papermakers were not informative and the new machine was kept strictly secret. The construction and operation of early beaters are outlined according to descriptions which appeared in the literature of the 18th century. 4 illustrations in the original. E.S.

INDICATORS AND TEST PAPERS

RAMSTAD, PAUL E., and VOLZ, FRANCES E. Did it thaw? Gel will tell. Food Inds. 22, no. 12: 182, 184 (December, 1950).

An indicator for determining the extent to which frozen foods have been exposed to thawing temperatures is described. The indicator consists of a gelatin gel enclosed in an oxygen-permeable, transparent envelope. The gel contains an oxidizing enzyme, a colorless phenolic compound capable of being oxidized to a dark color, and a suitable concentration of ascorbic acid, which regulates color development at a desired rate. A marked discoloration of the thawing indicator results from exposure to thawing conditions. The concentration of ascorbic acid which inhibits oxidation and hence discolora-

tion can be adjusted to meet the requirements of various products. 1 table and 2 illustrations. M.W.

INSTRUMENTATION

HUGHES, J. W. New 32-million-dollar paper mill. Instrumentation 5, no. 1: 13-16 (October-December, 1950); Paper Trade J. 131, no. 26: 23-4, 26 (Dec. 28, 1950).

The over-all mill instrumentation of the Coosa River newsprint mill is described and illustrated. Pneumatic transmission of instrument readings is largely responsible for the success of the system. A few typical applications of instrumentation in the various mill departments are presented. 10 illustrations. M.W.

JUTE

CALLOW, H. J. Note on the effect of urea-formaldehyde treatment on the photochemical discolouration of bleached jute. J. Textile Inst. 41, no. 10: T404-6 (October, 1950).

In an attempt to reduce the tendency of bleached jute to undergo photochemical reaction, the jute was treated with urea formaldehyde. A partial inhibition of the decoloration resulted, especially in those cases where an excess of formaldehyde was used in forming the precondensate. Maximum reduction occurred when the mild washing stage which removes the unreacted components and resin deposited on the surface was omitted. However, when the bleached jute containing urea formaldehyde was subsequently exposed to severe alkaline conditions, the discoloration on exposure was as great as with the untreated pulp. These two results indicate that the surface resin might prevent light from reaching the sensitive components, or that some of the polymer blocked the reactive groups of the lignin. To investigate this point further, the reactive phenolic or enolic groups were blocked by methylation with diazomethane and then treated with urea formaldehyde. No further effect on the discoloration was apparent, and it is concluded that the inhibiting action of the urea formaldehyde is related to the photochemical reactions of the lignin. Tensile strength determinations indicate that some of the fiber is damaged permanently in this treatment. 2 tables and 8 references. M.W.

LIGNIN

CHEMICAL INDUSTRIES. Aged in wood. Chem. Inds. 67, no. 6: 878-9 (December, 1950).

Acetovanillone, the latest addition to the list of lignin derivatives obtained by the Chemical Division of the Marathon Corp. is now available in pilot-plant quantities at about 99% purity. Aside from vanillin it is the only lignin-derived chemical now available, and as such will be important in organic synthesis. Its chemical configuration and reactivity suggest its utilization as an intermediate in the synthesis of photographic chemicals, food preservatives, pharmaceuticals, fungicides, antioxidants, plant hormones, and dyes. M.W.

RICHTZENHAIN, HERMANN. The oxidative degradation of methylated lignin preparations. Svensk Papperstidn. 53, no. 20: 644-8 (Oct. 31, 1950). [In German; Swedish and English summaries] *cf.* B.I.P.C. 21: 92.

Several methylated lignin preparations were oxidized with potassium permanganate, and the yields of veratric, dehydrodiveratric, isohemipinic, and metahemipinic acids were determined. Methoxyacetic acid, succinic acid, and an acid, $C_{13}H_{14}O_7$, were found as new oxidation products. Isohemipinic acid

was recognized as a characteristic degradation product of all lignin preparations, which is considered as a proof that the native lignin contains two different phenolic groups. The increase of groups which form isohemipinic acid by condensation reactions during a drastic alkali treatment of lignin or during sulfate cooking is considered possible. Metahemipinic acid is formed only from lignin preparations which have been isolated from wood by acid reagents. The possibility of a condensation of guaiacylpropane units in the 6-position is discussed. It is probable that the native lignin contains lignan groups which form isolignan units with acids. The degradation results demonstrate that the fission of open or cyclic phenol ether bonds cannot play an important role in the sulfite cooking process. 1 table and 28 references. E.S.

LIGNIN—ABSORPTION SPECTRA

SOHN, A. W. U.V. absorption spectra of lignin and ligninlike substances. Das Papier 4, no. 19/20: 379-84 (October, 1950). [In German]

A critical review of previous work is presented. The author concludes that, whereas chemical reactions show clearly that lignin contains the phenylpropane structure, an ultraviolet absorption maximum of about 280 mμ is in itself no guarantee of aromatic nuclei. Such a maximum may characterize 5- as well as 6-membered rings. The author gives the ultraviolet absorption curves for both furfural and reductic acid. Ultraviolet absorption spectra, which may be of value in gaging the "purity" of a lignin product, must be interpreted with caution, because sugar degradation products may interfere with the lignin spectra. 9 figures and 11 references. L.E.W.

MACHINERY—CALENDERS

CARRIER, G. F. The use of skewed rolls in calendering operations. J. Applied Mechanics 17, no. 4: 446-7 (December, 1950).

In many commercial operations it is desirable to produce a uniform sheet of material by passing the viscous raw ingredients through rotating cylindrical rolls. With rolls supported at the ends only there is danger of wide variations in thickness of the finished product. This may be overcome by "skewing" the rolls the amount necessary for any given thickness and material properties. The author presents an analytical approach to the determination of the optimum operating position of the rolls. 2 figures. E.S.

MACHINERY—CHIPPERS

SAMSON, TORSTEN. Brief report on the Ottersland chipper with 10 knives and a high number of revolutions. Das Papier 4, no. 11: 199-202 (June, 1950). [In German] *cf.* B.I.P.C. 12: 359.

The construction and operation of the Ottersland multiknife chipper are described (*cf.* U. S. patents 2,247,665 [July 1, 1941] and 2,299,248 [Oct. 20, 1942]). 1 table and 7 figures. E.S.

MACHINERY—CONVERTING MACHINERY

HAMILTON, GEORGE. Success story of rotary printing and web-fed die cutting. Boxboard Containers 68, no. 696: 6-8, 78 (December, 1950).

The use of a combination of rotary printing and web-fed die cutting for making cartons is described, which is in use at the P. J. Kansteiner Co., Milwaukee. Its outstanding features include its adaptability to a general run

of cartons, and a new principle of registration between printing and die cutting which is based on a punching unit and cross perforator. The greater potential production and low makeready and plate costs make the equipment economical for short- or long-run work. There is also a savings in the number of man-hours per ton produced. 6 illustrations. M.W.

THEUERKAUF, A. The manufacture of pasted and covered boxes. Allg. Papier-Rundschau no. 20: 986-90 (Oct. 26, 1950). [In German]

The author discusses the raw material (board, cover paper, and adhesives) and different types of German converting machinery (chiefly by Jagenberg) for the various processes used in the manufacture of covered boxes. 18 figures. E.S.

MACHINERY—CUTTERS

ROEDEL, WALTER. Treatment of knives of cardboard cutters (shears). Allg. Papier-Rundschau no. 21: 1037 (Nov. 12, 1950). [In German]

Brief directions for the correct dressing of the knives of cardboard cutters for conversion processes are given. When knives have become blunt and must be removed, the directions of the manufacturer should be followed; the grinding of the knives should always be carried out by experts, because one incorrect treatment makes them unfit for further use. 1 figure. E.S.

SCHULKIND, D. W. Development of new Lawson cutter result of intensive research. Paper & Paper Products 92, no. 6: 9-10 (Dec. 5, 1950).

A new cutter for the accurate cutting of difficult-to-cut paper is described, such as mimeograph, tissue, fluffy, or cockle-finished paper; it is equipped with a hydraulic clamp and knife bar pulled in a straight line and can be operated at speeds hitherto not thought practical in paper mills. An automatic spacing device with a hydraulically operated and electronically controlled back gage was also developed, which eliminates the manual gaging by the operator and makes increased production possible. E.S.

MACHINERY—DRIVE

ANON. Sectional paper-machine drives with Colombes-Texrope variable speed transmissions. Papeterie 72, no. 10: 543, 546-7 (October, 1950). [In French] *cf.* B.I.P.C. 20: 873.

The advantages of Vari-pitch V-belt drives are discussed. E.S.

MACHINERY—DRYERS

BROOKOVER, ROBERT S. New equipment improves operations at Philadelphia board mill. Paper Ind. 32, no. 9: 964-5 (December, 1950).

The installation of a Cochrane C-B condensate-drainage control system on an old seven-cylinder machine with 81 driers at the Crown Paper Board Co., Philadelphia, improved the quality of the product, increased production, and permitted fuel savings. 2 figures. E.S.

MACHINERY—ELECTRIC EQUIPMENT

FAUGHNAN, D. Characteristics of the N. S. variable speed a.c. motor. Pulp Paper Mag. Can. 51, no. 12: 120-4 (November, 1950).

The construction and operating principles of a variable-speed, a.c. commutator motor are described, which is a polyphase induction motor with shunt motor characteristics. Stepless speed control is provided by the use of a polyphase induction regulator through a range of 10 to 1 with good speed regulation, efficiency, and power factor. There is almost no restriction on the application of this motor, particularly where smooth controlled acceleration during starting, constant running at any intermediate speed, and operation over a wide speed range are required. 8 figures. E.S.

SORENSON, R. F., KNIGHT, W. V., and FOSTER, R. W. Selection of electric motors for paper mill application; a preliminary report of the TAPPI Electrical Subcommittee. Tappi 33, no. 12: 572-7 (December, 1950).

Electric motors form the heart of the motive power in a pulp and paper mill. To provide a maximum of reliability, motors must be judged as to type of enclosure, insulation of the windings, type of bearings, and their designed operating characteristics. Standardization of motors is of prime importance for simplified spare-parts inventory; however there are many special applications where a motor must be selected to suit the individual problem. Where there is a special application problem, thought must be given to the various equipment available and final selection made to suit the individual mill. 1 table and 1 diagram. E.S.

MACHINERY—EMBOSSING MACHINERY

ANON. Embossing process gives new effects. Modern Plastics 28, no. 4: 72-3 (December, 1950).

Reference is made to a new German embossing process for vinyl films, called Echolux, which was developed by Paul Dornbusch and is based on a study of light reflections and the creation of patterns which pick up and reflect light at various angles. The appearance and depth of shading is largely an illusion, because the film feels smooth to the touch. The underlying theory is based upon the breaking up of the motif into areas of parallel, curved, straight, or angled lines set down in different directions to make up the over-all design; when the film is turned or moved, the lines show up in different shades of the reflected color. The embossing rolls consist of an engraved steel roll carrying the embossing pattern and a rubber counter roll. Whenever a new pattern is used, only the engraved roll must be changed; a heated roll is used for thin film and a cold roll for thick sheets. The same cooled counter roll is used in each case. These rolls can be used on other calenders, but are particularly adapted for use on the Dornbusch embossing calender. In addition to vinyl plastics, the machine can also handle fabric, leather, cellophane, celluloid, aluminum foil, and paper. 9 figures. E.S.

STOECKHERT, KLAUS. New methods for embossing thermoplastic materials. Kunststoffe 40, no. 11: 357-8 + 1 sample sheet (November, 1950). [In German]

The Dornbusch embossing calender is described; see abstract above. 1 figure and 1 embossed vinyl sample sheet. E.S.

MACHINERY—GEARS

BURT, BRYAN M. Use of a mechanical differential gear for speed control. Pulp Paper Mag. Can. 51, no. 12: 127-9 (November, 1950).

The principle of differential control is discussed, as well as its advantages where it is applicable, with particular reference to the nut and screw-type of differential gear. The differential method of detecting and initiating the correction of speed error is compared with other ways in which the problem is sometimes solved. 1 diagram. E.S.

MACHINERY—GRINDERS

GUSTAFSSON, G. RURIK. The Roberts grinder and its use in Scandinavian countries. Paper and Timber (Finland) 32, no. 11: 347-51 (November, 1950). [In Swedish; English summary]

The Roberts grinder and its adaptability are reviewed with references to the pertinent literature. The first Scandinavian installation at the groundwood mill of Tinfos Papirfabrik in Norway and the results with three units are described; other Scandinavian installations are on order but not yet in operation. An analysis of an average groundwood sample from the Norwegian mill is included; its quality corresponds with that of standard groundwood. The operating experience has been satisfactory. 1 table, 7 figures, and 15 references. E.S.

ULLMAN, U. The distribution of the grinding pressure in the Roberts grinder. Svensk Papperstidn. 53, no. 20: 654-7 (Oct. 31, 1950). [In Swedish; English and German summaries]

Assuming production to be nearly proportional to the specific grinding pressure (I), equations are developed for (I) along the grinding surface in the Roberts grinder. The distribution of (I) in a Roberts grinder is compared with that of other grinder types. The effect of varying pressure on the quality of the resulting pulp is discussed. 1 table, 2 figures, and 3 references. E.S.

MACHINERY—PACKAGING MACHINERY

ANON. The Stadler Hurter roll wrapping machine. Pulp Paper Mag. Can. 51, no. 12: 134 (November, 1950).

A machine for the wrapping of newsprint rolls is described, although it can also be used for linoleum, aluminum foils, cellophane, wire and cable rolls, etc. The machine is fully automatic in operation, wrapping, crimping, gluing, cutting, sealing, and ejecting the finished rolls; the production is 1440 rolls per 24 hours for about 3 to 5 cents per ton. Manual labor costs about 30 to 36 cents per ton, according to mill figures. 1 illustration. E.S.

MACHINERY—PAPER MACHINE

STEWART, A. E. New development on high speed paper machine. Pulp Paper Mag. Can. 51, no. 12: 130-2 (November, 1950).

The author describes the details of two developments by the Dominion Engineering Co.: a combination headbox and slice with regulated flow distributor unit, first installed at Bowater's Corner Brook mill in Newfoundland, and an improved, totally enclosed small gear drive which may be readily attached to any existing drier system at present equipped with large gears. 6 diagrams. E.S.

MACHINERY—PRINTING MACHINE

NEKLUTIN, C. N. New printing developments for book match production. Am. Paper Converter 24, no. 12: 9, 44 (December, 1950).

The approach used by the Universal Match Corporation to the problems of the economical multicolor printing of book match covers for short runs requiring comparatively small printing areas is described. It is based on the development of a high-precision feeding mechanism, the roller gear cam, and the use of the offset principle in the construction of a narrow-web multicolor printing press. 2 illustrations. M.W.

MACHINERY—PUMPS

KARASSIK, IGOR J., and CARTER, ROY. Pumps and how they work. Paper Ind. 31, no. 5: 603-5; no. 6: 689-92; no. 7: 825-7; no. 9: 1067-9, 1076; no. 11: 1320-3 (August-October, December, 1949; February, 1950); 32, no. 1: 60-2; no. 4: 389-91; no. 5: 507-8; no. 7: 728-30; no. 9: 972-3 (April, July, August, October, December, 1950).

This is a series of articles on the practical fundamentals of centrifugal pumps. The titles following the first installment are as follows: Designs and functions of pump casings, p. 689-92 (September, 1949); Multistage pumps, p. 825-7 (October, 1949); Centrifugal pump impellers, p. 1067-9, 1076 (December, 1949); Centrifugal pump design, p. 1320-3 (February, 1950); 32, no. 1: Design features of centrifugal pump shafts, p. 60-2 (April, 1950); Centrifugal pumps . . . stuffing boxes & packing perform vital function, p. 389-91 (July, 1950); Centrifugal pumps . . . mechanical stuffing box seals, p. 507-8 (August, 1950); Types of bearings used on centrifugal pumps, p. 728-30 (October, 1950); Lubrication of centrifugal pump bearings, p. 972-3 (December, 1950). The articles are profusely illustrated; additional installments will be published in 1951. E.S.

MACHINERY—REFINERS

RENARD, A. The "Cyclone" refiner. Papeterie 72, no. 9: 473, 475, 477 (September, 1950). [In French]

The construction, mode of operation, and advantages of the new "Cyclone" refiner are described. 5 diagrams. E.S.

SPROUT, WALDRON & COMPANY, INC. Company gets higher yield of fiber from wood . . . Chem. Processing 13, no. 12: 12-13 (December, 1950); *cf.* B.I.P.C. 20: 778.

The use and operation of three single-disk Sprout-Waldron refiners by the Maizewood Insulation Co., Dubuque, Iowa, are described; they are employed for refining screen rejects, semichemical chips, spent chips after extraction processes, bagasse, straw, and similar grasses, lumps in reclaimed waste paper stock, and cooked chemical pulps as well as rag and other half-stocks. 1 illustration. E.S.

MACHINERY—SAVE-ALLS

BIRD MACHINE COMPANY, *South Walpole, Mass.* White water clarified continuously for re-use; fiber, filler recovery virtually complete. Chem. Processing 13, no. 12: 80-1 (December, 1950).

A brief description of the Bird-Gibbs Clarifiner is given, which operates on Fourdrinier-machine white water, cylinder-machine water, mill-waste water in general, board-mill combined waste water, and other plant liquids. The units are built in a variety of sizes to meet different requirements. 1 flowsheet and 1 illustration. E.S.

MACHINERY—SHAKING MECHANISM

BALTZ, W. E. A contribution to the shake drive. Das Papier 4, no. 13/14: 285-8 (July, 1950). [In German]

This is a theoretical study with suggestions for the improvement of the shake drive, including a more quiet operation. 5 figures. E.S.

MACHINERY—STEAM TRAPS

JOP. The steam trap. Wochbl. Papierfabr. 78, no. 19: 571 (Oct. 15, 1950). [In German]

The important functions of steam traps are discussed briefly, as well as different constructions and their proper maintenance, with particular reference to the operation of the air valves. 1 diagram. E.S.

MACHINERY—VALVES

THE LUNKENHEIMER COMPANY, *Cincinnati.* Particular valves and specific paper mill installations. Paper Mill News 73, no. 49: 46 (Dec. 9, 1950).

Two charts are presented which identify the list of fluids handled by each piece of equipment in the sulfite and soda or sulfate processes, with recommendations for valves of suitable construction materials. M.W.

MATERIALS OF CONSTRUCTION

CHEMICAL ENGINEERING. Construction materials in the paper industry. Part III—Acid pulping. Chem. Eng. 57, no. 12: 223-4, 226, 228, 230, 232, 234, 236 (December, 1950); *cf.* B.I.P.C. 21: 247.

In this symposium the following materials of construction which are used in acid pulping are discussed: Worthite, lead, cements, rubber, iron and steel, high-silicon irons, nickel and nickel alloys, Chlorimets, stoneware, and Durimet 20. Data concerning the corrosion of these materials are presented. 3 tables and 5 illustrations. M.W.

MICROSCOPY (ELECTRON)

FISCHBEIN, IRWIN W. Electron microscopy of wet biological tissues by replica techniques. J. Applied Phys. 21, no. 12: 1199-204 (December, 1950).

The study of wet biological tissues *in situ* using the electron microscope was made possible by modifying existing replica techniques and developing a new wet-replication method. The shortcomings of existing replica techniques are discussed, and the modifications necessitated are described. Replicas of wet tissues were produced in extremely thin polystyrene films which could be observed directly in the electron microscope; however, superior results were obtained by preparing silica replicas from the replicated polystyrene films. A modified two-replica silica method proved satisfactory but the three-replica silica method developed was preferable. Electron micrographs of wet wood-fiber surfaces used to illustrate these techniques reveal new data concerning the submicroscopic cell-wall structure. The problem of interpreting replicas of partially degraded and disorganized materials is illustrated and discussed briefly. 8 figures and 11 references. E.S.

MILL MANAGEMENT

ARMSTRONG, ARTHUR A. Summary of a personnel program. Paper Trade J. 131, no. 22: 339-41 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

MOORE, JAMES D. Some new concepts of supervisory training. Boxboard Containers 68, no. 696: 31-2 (December, 1950).

Some past methods of industrial training are reviewed, and new concepts are discussed. Emphasis is now placed on the training of supervisors and minor executives, and the aim of this training is to develop supervisors who are capable of training workers under them, and who can assist in management by acting as middlemen between officials and workers. Some results of this policy as reported by Dodge-Chrysler and Detroit Edison are outlined. M.W.

STEVENS, ELMO B. Personnel management. Paper Trade J. 131, no. 22: 341-7 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

WINSTON, C. C. How to set up a maintenance stores department. Paper Ind. 32, no. 9: 965-6 (December, 1950); *cf.* B.I.P.C. 21: 176.

The problem is discussed of providing adequate maintenance stores in pulp and paper mills, which are often located in remote areas where quick delivery cannot be secured. Useful suggestions are given for having the required supplies on hand whenever they are needed, without exceeding the desired economic balance in the dollar investment. E.S.

NEWSPRINT

ANON. New Zealand newsprint development; the Murupara project. Newsprint Service Bur. Bull. no. 394: 6-7 (Nov. 16, 1950).

The essential features of the New Zealand Forestry Service's proposal for the establishment of an integrated sawmill and pulp and paper plant at Murupara are presented. The most important development of the year was the acceptance of the departmental recommendation that private management and direction are necessary for so large a development, and negotiations are under way with British interests. The plan includes an ample supply of raw materials, a detailed integration policy, the production of high-quality timber which will be able to compete at world-parity prices with timber from America and Europe, the production of good-quality newsprint, and a long-range profit rate of around 7%. Statistics concerning raw materials, production figures, capital requirements, and an improved trade balance with Australia are included. M.W.

ANON. Paper pulp—Kinsley opens pilot plant in Cleveland, also directs Argentine operation. Chemurgic Digest 9, no. 12: 12-13 (December, 1950); *cf.* B.I.P.C. 20: 205-6.

The completion of a pilot plant at Cleveland, Ohio, by the Kinsley Chemical Company is a major development in the utilization of fibers of annual growth in the pulp and paper manufacturing industry. Kinsley is also directing the establishment of one of three newsprint mills in Argentina, the Fibrocel Argentina. This new mill will utilize bagasse and wheat straw

as pulp materials, and it is described as the first operation of size in the world to produce newsprint from the fibers of annual growth. 1 illustration. M.W.

OCCUPATIONS—DISEASES AND HYGIENE

SCHWEISHEIMER, W. Heat and humidity in the paper and pulp manufacturing industry. Pulp Paper Mag. Can. 51, no. 12: 236-7, 239 (November, 1950).

Although the manufacture of pulp and paper is not regarded as an unhealthy occupation, the combination of high temperatures and high humidity of the air, sudden changes of temperature, and dampness present health hazards to pulp- and papermakers. Different methods useful for combating the ill effects are listed; some workers can tolerate more heat than others. It may be necessary to assign certain tasks to those individuals who can tolerate heat and humidity better; negroes are much more susceptible to heat stroke than white people. E.S.

PACKAGING

ANON. Meat of this story is in the container. Packaging Parade 18, no. 215: 49 (December, 1950).

Prepackaging of chopped and ground meats in one-pound nested paper containers is being adopted by many butchers. Handling in the market is facilitated, and the meat can be kept fresh for a longer time. Consumers seem to be willing to pay more for a neat package which assures them of cleanliness and fits easily into a home refrigerator. 5 illustrations. M.W.

ANON. Packaging. Modern Ind. 20, no. 6: 38-44 (December, 1950).

In spite of a threat of shortages, the primary concern in packaging fields is still the maintenance of attractive, economical packaging. Chief trends in this direction are: standardization of design and size, fractional, or smaller-unit packaging, use of new materials, and relating package design to materials-handling equipment. Standard domestic packaging is not always adequate for defense orders, however, and special attention will have to be directed to design to overcome mishandling. Efficient, economical, and attractive packaging depends on co-ordination with every other product operation. 27 illustrations. M.W.

BROWN & BIGELOW, *St. Paul.* Teamwork relieves footwork in playing card packaging. Packaging Parade 18, no. 215: 46-7, 81-2 (December, 1950).

The system employed by Brown & Bigelow in the packaging of playing cards is described. 7 illustrations. M.W.

DAY, FREDERICK T. Packaging and display in Belgium. Brit. Packer 12, no. 11: 34-6 (November, 1950).

The general high standard of consumer goods in Belgium has resulted in special attention to packaging. Some of the latest trends are reviewed and illustrated. 8 illustrations. M.W.

MARLIN FIREARMS CO., *New Haven, Conn.* Safety blade sleeve. Modern Packaging 24, no. 4: 84-6 (December, 1950).

A new development in packaging razor blades is described, a new "Safti-Quik" wrap which is its own dispenser. The waxed paper wrap has a die-

cut end opening which exposes one slot in the blade, so that the user can hook the blade on the razor and slide the wrap off without touching the blade with his fingers. Tests indicate that the die-cut opening causes no loss in corrosion protection. The blades are packaged in tuck- or sleeve-type cartons. 4 illustrations. M.W.

MODERN PACKAGING. Jell-O. Modern Packaging 24, no. 4: 88-93, 192, 194 (December, 1950).

In addition to pioneering in the field of packaged desserts, Jell-O is now the largest selling prepared dessert and one of the best known products in the field of packaged grocery specialties. The Jell-O bag-in-a-carton package has become the basic pattern for high-speed, economical packaging of every similar product. A history of the development of this product and its packaging is given, and mention is made of other Jell-O products. 11 illustrations. M.W.

RUBINATE, FRANK J. Available packaging materials. Tappi 33, no. 12: 103-4A (December, 1950).

The author mentions the following materials available for food packaging: papers, plastics, metallic foils, metal cans, glass, paperboard as used in folding and setup boxes, corrugated and solid containerboard for shipping containers, wood, textiles, adhesives, waxes, and combinations of these materials. In selecting any of these for a special application, the following factors should receive consideration: the characteristics of the item to be packaged, destination, storage, handling, equipment, cost, and eye appeal. Indiscriminate use of substitute materials must be avoided because it is a dangerous, costly practice. E.S.

STANDARD BRANDS, INC., *New York*. Fleischmann's adopts the nitrogen pack. Modern Packaging 24, no. 4: 98 (December, 1950).

Fleischmann's New Improved Active Dry Yeast is now packaged in a laminated Pliofilm-metal foil, nitrogen-filled package. The advantage of the nitrogen pack is the stability conferred on the living yeast cells with the result of a shelf life of five to six months. The package is also flexible, airtight, and moistureproof, and it is claimed that the nitrogen prevents the yeast from being significantly affected by average room temperatures. 1 illustration. M.W.

STATELER, E. S. Vacuum bag it—for better quality. Food Inds. 22, no. 12: 38-9 (December, 1950).

Maximum freshness of packaged bacon is attained by Armour and Co. through the use of vacuum packaging in heat-sealed, laminated Pliofilm or cellophane bags. The exclusion of air prevents drying, discoloration, and mold and bacterial growth. Tests have shown the shelf-life of this product to be more than 21 days without loss of freshness. The package is transparent, except for an opaque portion on which the trademark identifications and price are placed, and it is semirigid and easily handled. A description of the method of packaging is included. 4 illustrations. M.W.

STERN, WALTER. The role of a packaging engineer. Tappi 33, no. 12: 102-3A (December, 1950).

The principal job of a packaging engineer is to co-ordinate; he is rarely an expert in a limited field, but rather is supposed to have an encyclopedic knowledge. If he does not have firsthand specific information, he knows where to find it. E.S.

WIEBOLDT STORES, INC., *Chicago.* Wieboldt proves practicality of self-service department stores. Packaging Parade 18, no. 215: 48, 77 (December, 1950); *cf.* B.I.P.C. 20: 798.

The Wieboldt stores have extended self-service to the hardware, housewares, electrical goods, auto supplies, and paint departments of two of its stores, with notable success. One of the major factors in the success of a self-service venture is packaging. According to Wieboldt's, the greatest need for better packaging is in small hardware items, such as screws, nails, washers, etc. The suggested requirements for self-service packaging of these items include: visibility of contents, strength, inclusion of related essentials, and packing in logical quantities. 6 illustrations. M.W.

WYLER & CO., *Chicago.* Successful dehydrated foods. Modern Packaging 24, no. 4: 114-16 (December, 1950).

The packaging methods of Wyler & Co., a leading producer of dehydrated soup mixes and related items, are described, including laminated, heat-sealed foil envelopes and duplex cellophane bags, as well as individual folding cartons, for self-service merchandising. 3 illustrations. M.W.

PAPER—COATED

LAMB, E. L. Coating. Paper Trade J. 131, no. 22: 279-80, 282, 284-6 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 19 figures. E.S.

PAPER—COATED (HOT-MELT)

ST. REGIS PAPER CO. Polyethylene on paper. Modern Plastics 28, no. 4: 67-71 (December, 1950); *cf.* B.I.P.C. 21: 178.

The extrusion process used by the St. Regis Paper Co. for applying polyethylene to paper is described. Data are included on moisture-vapor permeability tests and comparison strength tests of polyethylene-coated bags. Some of the properties and uses of Plyolene bags are reviewed, and a brief discussion is given concerning the favorable economic outlook for polyethylene-coated papers. 8 illustrations. M.W.

PAPER—CONVERSION

EVANS, JOHN C. W. Paper and paper board converting operations in the province of Quebec. Pulp Paper Mag. Can. 51, no. 12: 104-5 (November, 1950).

There are in the neighborhood of 125 establishments with a production value of 85 million dollars per year in the province of Quebec. A list of manufacturers of paper boxes and bags, miscellaneous paper products, and roofing felts is presented. E.S.

PAPER—FILLERS

BEARCE, GEORGE D. Fillers and loading. Paper Trade J. 131, no. 22: 243, 247-8 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 1 table and 2 figures. E.S.

CALLIGHAN, OLIN W. Fillers and loading. Paper Trade J. 131, no. 22: 242-3 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 1 table. E.S.

GUSTAFSSON, CHARLEY, NORDMAN, LARS, and RISSANEN, TOIVO. On the determination of the scattering coefficient of fillers in suspension. Paper and Timber (Finland) 32, no. 11: 325-8 (November, 1950). [In English]

The scattering coefficient of fillers has been determined from transparency and reflection data of filler suspensions, using the Kubelka-Munk and Gurevič equations for the calculation of the scattering power. These values were corrected to correspond to the scattering conditions in air. Different sources of error in the measurements are discussed. To eliminate partially the influence of these errors, the final value of the scattering coefficient (S') is calculated from the increase in scattering power resulting from an increase of the filler concentration in the suspension. The S'-values obtained for seven grades of china clay are compared with size-distribution curves obtained by Casagrande's sedimentation method. The curves were found to grade the samples in the same general order as the S'-values determined in suspension. Since the optical method is less time consuming, its use as a routine method for evaluating filler quality is suggested. In addition, it is also more convenient to express filler quality by a single number which is closely related to the opacifying power of the filler. 4 tables, 2 figures, and 8 references. E.S.

PAPER—MERCHANDISING

GOODRIDGE, J. E. Competition by distributors of paper products other than paper merchants. Am. Paper Merchant 47, no. 12: 20-2 (December, 1950).

Chief among the outside factors in the distribution of paper products is the wholesale grocer. The characteristic advantages possessed by the wholesale grocer in comparison with the paper merchant are reviewed, and possible measures are discussed which the paper mechant can adopt to offset this competition. It is suggested that paper merchants concentrate on well-planned merchandising programs designed to increase the volume and number of resale paper items to be sold to retail grocers. Careful study of cost-reduction possibilities is also recommended. M.W.

PAPER AND PULP INDUSTRY

ANON. British Columbia has suddenly become pulp and paper conscious. Can. Pulp Paper Ind. 3, no. 12: 16-18 (December, 1950).

British Columbia, the last undeveloped region of forest and water-power resources, is rapidly becoming the center of pulp and paper investment. Data on capital investment, production, and raw-material resources are given. 6 tables and 3 diagrams. E.S.

BERACHA, M. S. A study of the situation in the French paper industry. Papeterie 72, no. 10: 514-15, 517-18, 521 (October, 1950). [In French]

Statistical data are given for several characteristic years of the French paper industry; significant figures for world production, consumption, and exports are included. 8 tables. E.S.

IYDURAI, V. P. Scheme for the development of handmade paper industry. Pulp Paper Mag. Can. 51, no. 12: 111 (November, 1950).

The author mentions the possibilities of papermaking as a cottage industry in India, with particular reference to the selection of the correct site and the training of workers. E.S.

MÜLLER-HENNEBERG, H. M. Pulp and paper in the world market. Chemie-Ingenieur-Technik 22, no. 21: 469-70 (Nov. 14, 1950). [In German]

A brief review of the present world consumption of pulp and paper is given, with particular reference to the conditions and prospects in western Germany. The per capita consumption in western Europe amounted to an average of 36 kg. before the war; although the principal producing countries have again reached their prewar production, this average figure is now reduced to 28 kg. on account of increases in population. Sweden leads with 71 kg., followed by Norway with 54, Great Britain with 49, and Finland with 46 kg. 3 figures. E.S.

YOWELL, L. Q. The paper industry under the NPA. Am. Paper Merchant 47, no. 12: 18, 32-3 (December, 1950); *cf.* B.I.P.C. 21: 251.

The operational setup of the National Production Authority is outlined, and the results of a meeting of the Pulp, Paper and Board Industry Council (a division of N.P.A.) are discussed. M.W.

PAPER AND PULP INDUSTRY—EDUCATION

WERRY, W. W. Technical education in Quebec. Pulp Paper Mag. Can. 51, no. 12: 118-19 (November, 1950).

A brief outline of technical schools, trade schools, and specialized schools in Quebec is given, with particular reference to the pulp and paper school at Three Rivers. It is now adding a small integrated pulp and paper mill to its existing laboratories, class rooms, and offices (*cf.* B.I.P.C. 20: 27). E.S.

PAPER AND PULP INDUSTRY—LAWS AND LEGISLATION

PARKER, LEO T. Here are the answers to some legal questions. Paper Ind. 32, no. 9: 969-71 (December, 1950); *cf.* B.I.P.C. 21: 29.

Recent court decisions in lawsuits involving the pulp and paper industry are reviewed, including the liability of carriers, timber cutting rights on private property, the liability of a trespasser cutting trees illegally, valid contracts, and total disability. E.S.

PAPER AND PULP MILLS

ANON. Anglo-Newfoundland's rehabilitation program. Pulp Paper Mag. Can. 51, no. 12: 196, 198 (November, 1950).

Brief reference is made to a major rehabilitation program at the Grand Falls plant of the Anglo-Newfoundland Development Co., which will bring the ultimate newsprint capacity from 575 to 750 tons per day. The wood-preparation system will be completely revamped, and various improvements are scheduled for the seven newsprint machines and the ventilation system of the three machine rooms; the conversion of the steam plant from coal to oil has already been completed, as well as the installation of four lines of electrically driven grinders, which take wood in 4-ft. lengths instead of the previous 32-inch wood. 1 illustration. E.S.

ANON. Blandin additions; now on 100% supercalendering. Pulp & Paper 24, no. 13: 84, 86 (December, 1950); *cf.* B.I.P.C. 18: 607.

With reference to the conversion from a newsprint mill to a producer of high-quality, supercalendered book and magazine papers, the latest additions to the Blandin mill at Grand Rapids, Minn. are described briefly; they include new winders and supercalenders. The entire daily production of 160 tons of A and A1 printing papers can now be supercalendered. 3 illustrations. E.S.

ANON. Gt. Lakes Co. grows; additions at Fort William mill. Pulp & Paper 24, no. 13: 66, 68 (December, 1950).

Brief reference is made to recent additions at the Fort William newsprint mill of Great Lakes Paper Co., including a new groundwood room, one sulfite digester, alterations on the two newsprint machines, a Bagley & Sewall rewinder serving both machines, and a bark flash-drying system (*cf.* B.I.P.C. 20: 304-5). The company is considering the installation of a third newsprint machine. 4 illustrations. E.S.

ANON. Improvements at Canton mill. Pulp & Paper 24, no. 13: 60, 62 (December, 1950).

The substitution of Appalachian hardwoods (chiefly poplar, gum, and oak) for the exhausted supply of blighted chestnut (which required no barking) at the Canton, N.C. mill of the Champion Paper and Fibre Co. made the 30% enlargement of barking and chipping facilities necessary. Other changes include the installation of a new turbogenerator, the conversion of one cylinder machine to milk-bottle containerboard and the use of special lights for attracting and electrocuting night-flying insects, a new size press, a free-wheeling expander roll for keeping the sheet free from wrinkles and creases, etc. A new recovery boiler, four Cottrell precipitators, a mercury rectifier cell for producing 65 tons of chlorine daily, and a modern bleach plant for hardwood board are scheduled for completion in 1951. 3 illustrations. E.S.

ANON. Integration in Gatineau. Pulp & Paper 24, no. 13: 76, 78, 80 (December, 1950); *cf.* B.I.P.C. 19: 713.

An illustrated description of the integrated combinations of wood-using industries at Gatineau, Que. is given, which are under the control and management of Canadian International Paper Co. and associated companies. Seven plants (newsprint, bleached sulfite, building and insulation boards, Masonite products, plywood, ethyl alcohol, and magnesia insulation material) use a common wood supply, about 460,000 cords annually, nearly all of which comes from Canadian International's own limits on the Gatineau River; more than 80% is driven down the river. 1 flowsheet and 6 illustrations. E.S.

STEPHENSON, J. NEWELL. Quebec's pulp and paper industry since 1803. Pulp Paper Mag. Can. 51, no. 12: 95-103 (November, 1950).

A history of the pulp and paper mills in the province of Quebec since the establishment of the first mill in Canada at St. Andrews East, 43 miles from Montreal, in 1803 is presented. Twenty-two of the mills built in Quebec before 1900 are still in operation. 1 table and 11 illustrations. E.S.

PAPER MACHINE OPERATION

PRATT, HAROLD. Paper machine operation. Paper Trade J. 131, no. 22: 264-6, 268, 271, 273-4, 276-7 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 12 figures, 1 flowsheet, and 1 reference. E.S.

SCHAUWECKER, HEINZ. Problems in the regulation of stock feed to the wire and moisture control. Das Papier 4, no. 12: 259-60 (June, 1950). [In German]

The mutual relationship between basis weight and moisture content of the sheet leaving the paper machine are discussed. It is not possible to regulate the moisture content of the traveling web satisfactorily unless uniform basis weight is maintained. Reference is made to the Elektro-Integral regulator developed by Firma Paul Lippke for regulating the moisture content of the sheet on the paper machine and to electronic regulators for maintaining the feed of uniform stock quantities to the wire. Two records of basis-weight and moisture measurements from a paper-machine run are included which illustrate the relationship between the two; however, in practice, this agreement is not always as perfect as in this case, because many interfering factors exist, such as variations in the condition and operation of the drying cylinders, poor ventilation, local formation of vapors, etc. 2 diagrams and 1 table. E.S.

PAPER MANUFACTURE

KLEIN, FREDERIC S. Fine paper manufacture. Paper Trade J. 131, no. 22: 335-6, 338 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

PAPER SIZING

GERMANN, WILLY. Contributions to paper sizing. Wochbl. Papierfabr. 78, no. 19: 570 (Oct. 15, 1950). [In German]

The author discusses the cost factor in paper sizing and emphasizes the need for limiting size additions to the absolutely necessary minimum to obtain the desired sizing degree, a practice which is unfortunately often disregarded by the beaterman who, in an effort to be on the safe side, adds almost double the amount actually needed. Factory-prepared sizes; the correct order of furnishing the beater with size, alum, and fillers; drier temperatures; and the importance of the pH of the fiber suspensions are discussed very briefly. E.S.

KUMLER, RALPH W. The rudiments of paper sizing. Paper Trade J. 131, no. 22: 259-60, 262-3 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

MONSANTO CHEMICAL COMPANY. Thinking on molecular level saves dollars in paper sizing. Chem. Eng. 57, no. 12: 160 (December, 1950); *cf.* B.I.P.C. 14: 325.

Monsanto has produced a new synthetic resin, Mersize CD-2, designed especially for sizing paper. The molecular structure of the resin is such that more hydroxyl groups are available on a smaller molecule, hence less size is required to reduce the alum. The formulation calls for three parts of rosin and one part of Mersize on a dry basis; this combination is applicable to all pulps and allows as much as a 50% reduction in the total

weight of size in the furnish. Mersize imparts greater temporary wet strength and a lesser degree of feathering as measured by the ink-flotation test. It has a low viscosity and requires no special processing. Several mill trials reported excellent results. 1 table and 1 diagram. M.W.

TURBYNE, JOHN J. Paper sizing. Paper Trade J. 131, no. 22: 257-8 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

PAPER SPECIALTIES

ANON. Know your papers. Paper & Twine J. 23, no. 11: 13-15, 26-7; no. 12: 20-1; 24, no. 1: 12, 16-19; no. 2: 12-14; no. 3: 12-14; no. 4: 9-10; no. 5: 11-12, 14; no. 6: 11-12, 14; no. 7: 7, 26-7; no. 8: 7, 18-19; no. 9: 10-11; no. 10: 18-20 (January-December, 1950); *cf.* B.I.P.C. 20: 334.

Additional brief descriptions of the various types of paper and paperboard are given in dictionary form. This series covers subjects from K-B board through serpentine papers. M.W.

ANON. Progress in the standardization of envelopes and boxed stationery. Allg. Papier-Rundschau no. 17: 832-8 (Sept. 11, 1950). [In German]

Proposed revisions of the German standards DIN 678 (envelopes) and DIN 680 (window envelopes) are presented, as well as two new supplementary standards DIN 16551 (definition of terms used for envelopes and boxed stationery) and DIN 16552 (rulings for handwriting). 4 tables. E.S.

D. F. B. The manufacture of creped toilet paper. Papierwereld 4, no. 16: 295 (March 1, 1950); Papetier 4, no. 11: 83, 85 (November, 1950). [In Dutch and French]

The manufacture of creped toilet paper, as practiced in Holland, is described; it involves principally the use of waste paper with small additions of groundwood and chemical pulp. The stock-preparation equipment consists of a kollergang and a beater. The treatment on the paper machine follows the conventional papermaking practice, including one large creping cylinder which is electrically heated. The creped sheet is wound into large rolls; these are cut and rewound into smaller rolls, banded, and wrapped. E.S.

GALE, E. S., and STANESLOW, B. J. Rheology of carbon paper inks . . . Am. Ink Maker 28, no. 12: 34-41, 67 (December, 1950).

Carbon paper ink studies made during the last war with the object of becoming independent of imported vegetable waxes are presented. They are concerned specifically with carbon black-containing carbon paper inks used for "one-time" carbon paper and deal with the rheological properties of inks in the molten condition. The particular problems which are discussed are: (1) the problem of maintaining control of the rheological properties of the molten inks in production, and (2) the problem of securing the type of dispersion of the carbon black required to obtain the necessary low yield value and apparent viscosity when developing new formulations or introducing new raw materials. A series of materials which were tested for dispersing activity is appended. 2 tables, 9 figures, and 2 references. M.W.

GAUT, MARCEL. Letter envelopes. Papetier 4, no. 10: 71, 73, 75 (October, 1950). [In French]

A brief description is given of the manufacture of letter envelopes, including economic cutting and gumming operations; desirable properties, such as sufficient strength, light weight, opacity, and correct gumming; and special types (aerogram and window envelopes prepared by either a hot or cold varnishing process). E.S.

GAUTHIER, J. Modern techniques of producing wallpaper. Papterie 72, no. 9: 465, 467, 469, 471; no. 10: 535, 537-9, 541 (September, October, 1950). [In French].

A description of the development of wallpaper and recent innovations introduced into its production is given. A comparison of foreign techniques with those used in France leads the author to believe that extensive modernization is necessary if the French products are to survive in the world market. S.S.

MENUEZ, CAROLINE. Caterers offer a wide paper market. Paper Sales 10, no. 12: 17-18, 27 (December, 1950).

Caterers are a prime market for paper cups, plates, containers, napkins, and other paper products. The use of paper service enables caterers to increase the volume of their business and consequently their profits. The experience of caterers who have used paper service shows that it is well received by customers. 2 illustrations. M.W.

TOMODA, YOSHITADA. Photographic blueprint materials. J. Japan. Tech. Assoc. Pulp Paper Ind. 4, no. 5: 20-3, 81-2 (October, 1950). [In Japanese; English summary]

Photographic blueprint materials were studied with a view to the improvement of keeping qualities, sensitivity, contrast, and color density. It was determined that a paper base for sensitizing agents must exhibit a moderate absorptivity for the sensitizing solution so that the blue substance will be fixed on the fibers; the surface properties of the support are closely related to the photographic properties of the product. Tests revealed that a precoating of dextrin or gum arabic has very little effect on the finished blueprint paper, whereas a precoating of a 3% gelatin solution increases the contrast and blue density. Baryta paper was found to be unsuitable as a support for blueprinting materials. Ferric ammonium oxalate, which is 15 to 20 times more sensitive than ferric ammonium nitrate, proved to be the most satisfactory sensitizing substance. The concentration of potassium ferricyanide in the sensitizing solution should be held to a minimum for high-speed materials because the sensitivity of the product varies inversely with the concentration of ferricyanide. Sodium formate, sodium oxalate, and sodium acetate can also be used as sensitizing agents; however, excessive additions of these salts result in low sensitivity and high contrast. 1 table and 5 figures. E.G.S.

PARTICLE SIZE

ANDREASEN, A. H. M., KREBS, K., DALSGAARD-PEDERSEN, N. AA., CAMRADT-PETERSEN, E., and KJAER, B. Investigations on the passage of light through suspensions. J. Soc. Chem. Ind. 69, no. 10: 312-17 (October, 1950).

An examination has been made of the manner in which light passing through suspensions of solid materials in water and the light scattered from such illuminated suspensions, depend upon the particle size of the suspension.

The following concepts are introduced: the specific extinction coefficient of a suspension (ε) and the specific nephelo-value of a suspension (ν). The examination has been made to find out how these two quantities vary with the grain size of white as well as of some colored suspensions. For white suspensions, monodisperse preparations of barium sulfate produced by condensation and fractions of ground barytes produced by elutriation are used; for colored suspensions, elutriated fractions of chromic oxide and of pyrolusite are used. Special care has been devoted to the production of suspensions with a very high grade of monodispersity. It is found that both ε and ν for the white suspensions have a distinct maximum at grain sizes of the same order as the wavelength of the transmitted light, whereas ε for the colored suspensions shows a maximum at grain sizes which are several times smaller than the corresponding grain sizes in the white suspensions. 5 tables, 11 figures, and 3 references. E.S.

PATENTS

WEST, CLARENCE J. United States patents on papermaking, third quarter, 1950. Tappi 33, no. 12: 109-13A (December, 1950); *cf.* B.I.P.C. 21: 183.

A list of U. S. patents on papermaking for the third quarter of 1950 is presented. E.S.

PENTOSES AND PENTOSANS

GUTHRIE, JOHN D., and REEVES, WILSON A. Demonstration of the presence of a galactoaraban in raw cotton fiber. Textile Research J. 20, no. 12: 859-61 (December, 1950).

The experimental procedure in the analysis of an unknown constituent of cotton, amounting to about 0.8% of the fiber, is reported. The experiments indicate that part of the material in question is a polysaccharide which has the properties of a galactoaraban. The cotton was extracted by a water-acetone combination and deionized, evaporated to near dryness, and the precipitate separated by centrifugation in the presence of absolute alcohol. The nitrogen content of the material was found to be about 25%. The reducing sugar content before hydrolysis was 6%, calculated as dextrose; after hydrolysis it was 48%. This indicated that about 40% of the material was a polysaccharide. An analysis gave 15% pentose, calculated as arabinose. Paper chromatography was used to identify the hydrolyzed material further after it was again deionized. Galactose and arabinose were found to be present in high concentrations, and rhamnose, glucose, and inositol in low concentrations. It was found that a naphthoresorcinol-trichloroacetic acid-alcohol mixture was superior to ammoniacal silver nitrate as a developer in distinguishing the pentoses, ketoses, and aldoses. The presence of arabinose was further verified by x-ray diffraction patterns of its diphenylhydrazone, and galactose was verified by x-ray diffraction of mucic acid prepared from the galactose. 1 table and 7 references. M.W.

PHOTOCHEMISTRY

BOLLIGER, ADOLPH, and HINKS, NEIL T. Photochemical degradation of cellulose in the presence of tungstic acid. Australian J. Exptl. Biol. Med. Sci. 27: 569-73 (1949); C.A. 44, no. 15: 7057 (Aug. 10, 1950). [Abstract only available] *cf.* B.I.P.C. 20: 107-8.

Tungsten trioxide (I) and molybdenum trioxide (II), when finely dispersed on dry cellulose (filter paper) or other polysaccharides, assumes a blue color when exposed to light of 230-390 mμ wave length. Reduction to

colored oxides of a lower valence was presumed to be responsible for the change. With (I) the color was retained, but with (II) the coloration was lost in air if light of less than 230 mμ was excluded. Moisture accelerated the rate of color loss, but re-exposure to light restored it. During 13 days of exposure to sunlight there was no increase of reducing substances in the (II)-paper preparation, but up to 2% was produced in the (I)-paper preparation. One fourth of the latter was water soluble. The (II) paper became brittle on exposure to sunlight, but the (I) paper was unaffected. Irradiation of (II) with a mercury-arc lamp for one hour produced negligible amounts of reducing substances. Extended intermittent irradiation gave results comparable to the solar irradiation. M.W.

LANDOLT, A. The effect of light upon vat-dyed cellulose. Textil-Rundschau 5, no. 11: 441-55 (November, 1950). [In German]

Following a brief review of the various theories of the photochemical degradation of cellulose in the presence of leuco vat dyestuffs, the author describes his experiments with 38 different vat dyestuffs and their degrading action on cellulose, using various test methods, in an attempt to detect the substituents responsible for their activity or inactivity. The parent compounds of the dyestuff groups under investigation were found to have characteristic photosensitizing effects; these can be increased or reduced by substituents in different positions, in the molecule or by a special molecular structure. It seems improbable that a general rule for fiber degradation can be set up on the basis of the dyestuff constitution. The evaluation of the photosensitizing effect is further complicated by the fact that dyestuffs with different light absorptions are not comparable, because the light energy is a function of the wavelength. The author also found that, with a suitable experimental arrangement (which is described in detail), oxidation as well as reduction phenomena can be induced by irradiation of vat dyeings on cotton. This result confirms the previously expressed conjecture that the process of fiber degradation is composed of a number of successive reduction and oxidation reactions. 6 tables, 10 figures, and 22 references. E.S.

PHYSICAL TESTING—PAPER—STRENGTH

VILLARS, J. Some factors influencing the strength of paper. Papeterie 72, no. 9: 455, 457-8, 461, 463, 465; no. 10: 523, 525, 527, 529, 531, 533, 535 (September, October, 1950). [In French]

Using the results of original work and some previously reported findings, an analysis is made of the factors influencing the tensile strength and tear-resistance of papers. In general, those factors favoring fiber-to-fiber hydrogen bonding in cellulose (such as the presence of long fibers of high specific surface, the alignment of fibers, the presence of adhesive additives, and the drying and pressing of the sheet) lead to high tensile strength in paper. The most important factor contributing to tear-resistance, on the other hand, is the degree to which the fibers are interlaced. Thus long, round fibers (such as the summer tracheids of softwoods) whose surfaces can easily slide over one another and allow the fibers to mat in unoriented positions, favor the formation of high tear-resistant paper. It has been found that the presence of only a minimum number of bonds is necessary for optimum tear, and that further bonding is detrimental to this property. The author also discusses the effects of the digestion, drying, and physical treatment of the pulp upon the ultimate properties of the paper. 18 tables and 11 graphs. S.S.

PHYSICAL TESTING—PAPER—TENSILE STRENGTH

ANON. New tester for measuring gradually increasing as well as

intermittent (jerky) tensile stresses of paper and board. Allg. Papier-Rundschau no. 11: 560 (June 15, 1950). [In German]

A brief description is given of a new tensile tester which was developed by J. Bekk and is built by A. van der Korput in Baarn, Holland. The instrument can be used for measuring either slowly increasing stresses or those of an intermittent (jerky) nature, to which paper bags may be particularly subjected. The results of the two measurements are quite independent of each other. Many paper types are much less resistant to intermittent tensile stresses in the machine than in the cross-machine direction, a phenomenon which is not encountered with gradually increasing stresses. 2 illustrations. E.S.

PHYSICAL TESTING—PAPER BAGS

COUCH, ROBERT DE S., and MULDOON, T. J. Impact-fatigue test for paper. Modern Packaging 24, no. 4: 131-5, 180, 182 (December, 1950).

Because drop tests and other strength tests for paper show little correlation, it is not practical to predict bag performance on the basis of any one of these tests. A new impact-fatigue test is described which takes into account the series of small impacts to which packages are subject in shipping. The impacts in this test are applied by dropping metal balls through a tube onto a rigidly held piece of paper. The number of balls required to break through the paper is used as an indication of the impact-fatigue strength. Good correlation is obtained between this test and the drop test, and it appears to predict with fair accuracy the performance which may be expected from the paper. Certain conditions and variables in both the impact-fatigue and drop tests are discussed, and data are given in tables and diagrams on test results. A detailed outline of the test method is appended. 4 tables and 8 figures. M.W.

PHYSICAL TESTING—PULP—OPACITY

GIERTZ, HANS WILHELM. The opacity of paper pulps. I. Measuring methods. Svensk Papperstidn. 53, no. 21: 673-80 (Nov. 15, 1950). [In Swedish; English and German summaries]

The different methods for measuring opacity are reviewed briefly. The author points out that the correct way of reporting the opacifying properties of pulp is not by reference to opacity values, such as contrast ratio or printing opacity, but to the scattering coefficient (I). A method is described for calculating (I) from opacity measurements by the use of the Kubelka and Munk formula. A diagram for facilitating this calculation is included. It is shown that, within certain limits, (I) is not appreciably affected by either sheet thickness or the wavelength of the light used. The test sheets (about 60 grams/sq. m.) are formed in the standard Swedish sheet machine. They are pressed between blotting paper at a pressure of 5 kg./sq. cm. for seven minutes and then dried, still between blotters, in the usual manner at 60°C. The brightness and the printing opacity of the sheets are measured in a Hunter multipurpose reflectometer, using filter G and, preferably, black velvet as the black background. The basis weight, expressed as grams/sq. cm., is measured after conditioning at 20° and 65% R.H. Since the treatment of the pulp before and during the sheet-making procedure influences the resulting opacity, these standardized conditions must be employed or variations from these standards indicated. The scattering coefficients *s*, calculated from these values fall in the range of 100-600; the units employed are the same as those used by other workers (*cf.* Van den Akker, B.I.P.C. 20:255-6, and Nordman, B.I.P.C. 20:193-4). 4 tables, 3 diagrams, and 26 references. E.S.

PLASTIC FILMS—TESTING

SARGE, THEODORE W. Comparative study of water vapor permeability of saran films. Anal. Chem. 22, no. 12: 1541-5 (December, 1950).

Despite the conspicuous position which saran films occupy in any classification of transparent organic self-supporting uncoated water-vapor barriers, there has been little agreement among investigators concerning the absolute values of water-vapor transmission. This appears to be due chiefly to the diverse methods of attack employed and has resulted in such divergent values as to bring into question the reliability of published data. In the present paper a comparative study of the methods and data of three rather different techniques is made: standard cup tests (with modifications) which comprise a constant-pressure evaluation; a variable-pressure technique with new results on the modified General Foods transmission cell; and a high-vacuum variable-pressure technique. When all the factors that might influence the transmissions are examined, two are found to contribute most to the apparent discrepancies in reported values: the difference in transfer rate resulting from the vapor-pressure differential as exemplified by the constant-pressure and the variable-pressure extremes, and the time factor involved in the determinations. The latter varies from two to more than 24 hours, and this variation is extremely significant in view of experimental results. Finally, the removal of volatile constituents from plastic films usually involved in variable-pressure techniques contributes to the apparent discrepancy. Reduction of the data to the same conditions where possible indicates that published results are actually closer together than is apparent merely from transmission values. The final difference is less than $10^{\pm 1}$, which may be considered satisfactory where permeability constants in the extremely low range $P = 10^{-8}$ are involved. The remaining difference must be attributed to the two distinguishing steps in technique: vacuum deplasticization and pressure differential. A graphical analysis of water-vapor transfer data collected from cup tests indicates that a better correlation is obtained with "equivalent" than with short- or long-interval transmission data. 2 tables, 8 figures, and 7 references. E.S.

WALKER, W. S. Factors in nitrogen packaging. Modern Packaging 24, no. 4: 136-40, 192 (December, 1950).

The author presents an outline of requirements for the successful use of nitrogen in the packaging of products which are subject to oxidation and a description of tests which have been devised to check the leakage of bags and oxygen permeability of films. One type of leak test which measures dimensional changes of sealed bags maintained under conditions of controlled inflation by a vacuum system is described in detail. It is pointed out that vapor-resistant films and films which are capable of maintaining a vacuum are not necessarily effective oxygen barriers. Nitrogen packing permits remarkable improvements with regard to color, taste, odor, rancidity formation, and retention of vitamin content of many food products. Some of the foods which benefit from the process are enumerated. 1 table, 15 figures (including 6 machines capable of nitrogen packaging in flexible films), and 2 references. M.W.

PLASTICIZERS IN PAPER

KUBÁT, JOSEF. Plasticizing agents for paper; a literature survey. Svensk Papperstidn. 53, no. 21: 694-7 (Nov. 15, 1950). [In Swedish; English and German summaries]

A literature survey is presented which goes as far back as 1915. The plasticizing agents are discussed under the headings "genuine" and "lubricating" agents. The first group includes those substances which are capable of forming hydrogen bonds with cellulose and thereby decreasing the number of bonds in the paper structure; the second group deals with substances which exert a lubricating effect. The latter are used principally for paper twines and similar products, where a low frictional resistance is required. 76 references, chiefly to patents. E.S.

POWER, HYDRO-ELECTRIC

DUSSAULT, A. Hydraulic resources in Quebec. Pulp Paper Mag. Can. 51, no. 12: 106-10 (November, 1950).

The development of the hydraulic power resources of Quebec is outlined, with particular reference to the part played by the paper industry in many of the projects. 4 illustrations. E.S.

SINCLAIR, A. B. Power supply. Pulp Paper Mag. Can. 51, no. 12: 133-4 (November, 1950).

When a new mill is being constructed, a decision of the economic problem between the development of a power site within a reasonable distance of the mill and the purchase of power from a public utility may have to be made. The author describes the power supply of the mills of Price Brothers & Co., in which the two methods are combined; about two thirds of the primary power requirements are purchased. E.S.

PREHYDROLYSIS

ULLMANN, G. Some relations, economical and technical, between the pulp and paper trade and the textile trade. J. Soc. Dyers Colourists 66, no. 11: 576-8; discussion: 578 (November, 1950); *cf.* B.I.P.C. 20: 738.

Following a description of the invasion of the textile field by paper, the author discusses the prehydrolysis used in wood-pulp manufacture for the desizing of cotton goods. 6 references. E.S.

PRINTING AND PRINTER'S INK

ANON. Printers' paper problems. XIV. Natural and artificial maturing of paper. Indian Print & Paper 16, no. 65: 33, 35 (October, 1950); *cf.* B.I.P.C. 21: 187.

The purpose, beneficial effects, and limitations of artificial maturing or air conditioning of paper for printing purposes are discussed. E.S.

ARNOLD, JOHN. Printing friction glazed papers. Paper & Print 23, no. 3: 302, 304 (Autumn, 1950).

A summary is given of the various grades of friction-glazed papers. The problems which confront the printer when using glazed papers are discussed, and some precautions are suggested. The ink should be a first consideration and, for best results, should be chosen with the help of the inkmaker. Excessive heat should be avoided in the printing room since this causes the paper to curl. The largest possible sheet size should be used, and sufficient time should be allowed for the ink to dry. Particular applications for these specialized papers are mentioned, including various types of labels and seals. M.W.

DAY, ROBERT A. An introduction to printing methods and paper. Paper Trade J. 131, no. 22: 316, 318, 320, 322-3 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

REYNOLDS, A. P. The graphic arts. Paper Trade J. 131, no. 22: 310, 312, 314, 316 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

SIMMONS, ROBERT H. Developments in the graphic arts—1949-50. Tappi 33, no. 12: 30A, 32A, 34A, 38A, 40A, 42A, 44A, 48A (December, 1950); *cf.* B.I.P.C. 19: 266.

Developments for the period covered are reviewed under the headings: paper, inks, color, photographic illumination, air conditioning, drying and static eliminators, printing presses, printing plates and equipment, photography, resins and chemicals, adhesives, instruments, photo-composing, and miscellaneous. 43 references. E.S.

PULP WASHING

ZIMMERMAN, ERIK, and VRANIAN, HENRY. Pressure washing of kraft brown stock. Tappi 33, no. 12: 561-6 (December, 1950); Southern Pulp Paper Manuf. 13, no. 12: 60-1 (December, 1950). [Abridgment]

A description is given of the newly developed three-stage continuous-pressure washing system which has proved successful on board stock at a kraft pulp mill where two 300-ton airdry lines are in operation. The equipment is quite different from any other system, resulting in safe operation with considerable economy in water, heat, and space. Plugging difficulties have been successfully solved. Foam difficulties caused by air entrainment are eliminated because the system is maintained at pressure. In the presses the pulp is subjected to high pressures, discharging it at 37% moisture-free consistency, forcing liquor from the uncooked particles. Several pressings are made according to the number of stages desired, and between pressings the stock is repulped with countercurrent liquor. Consequently, excellent separation is obtained between stages. Because of the intense pressure and rubbing action in black liquor at 200°F., there is an indication of some fiber-strength development. The total water consumption for the 300-ton system is 180 gal./min. with temperatures exceeding 200°. The high wash-water temperatures allow more efficient blow-heat recovery and send hotter liquor to the evaporators. Because of high consistencies, the filtrate volumes are small, so that large pipe lines and large pumps are not used. This factor is responsible for a considerable saving of power. The total power consumption for a three-stage, 300-ton system is 1.36 h.p.-days per airdry ton. Because the equipment comes in compact integral units, there are many possible variations and arrangements which permit the economical use of space. 2 tables and 7 figures. E.S.

RAGS

TUCKER, L. B. The rag paper industry. Paper Trade J. 131, no. 22: 226, 229-30 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 2 figures. E.S.

RAYON—VISCOSE PROCESS

GÄRTNER, FRED, and SAMUELSON, OLAF. The state of solution in emulsion-xanthated viscoses. Svensk Papperstidn. 53, no. 20: 635-7 (Oct. 31, 1950). [In English; German and Swedish summaries]

Three types of cellulose (a viscose rayon, a sulfite dissolving pulp, and a hydrocellulose obtained by hydrolysis of the dissolving pulp) were shaken for six hours with carbon disulfide and sodium hydroxide of varying concentrations; the resulting xanthates were diluted with distilled water to identical cellulose-alkali concentrations. For comparison, a technical viscose was diluted with distilled water to the same concentration as the three emulsion-xanthated viscoses. The viscosity of all samples was found to be practically independent of the original alkali concentration; this result can only be explained by the fact that the state of solution is the same in all cases. Even in emulsion-xanthated viscoses the crystallites are dissolved, and the dilute solutions are molecularly dispersed in spite of the low alkali concentrations. Experiments with the ultracentrifuge confirmed these results; they showed that a viscose prepared by emulsion xanthation with an alkali concentration as low as 5.7% gives the same sedimentation constant as diluted technical viscose prepared from cellulose of the same molecular weight and sodium hydroxide of mercerizing strength. However, in order that molecular dispersion takes place, it must be preceded by intracrystalline swelling of the cellulose or partially xanthated cellulose. This intracrystalline swelling occurs at different alkali concentrations in different cellulosic materials, such as cotton linters and wood pulp. Intracrystalline swelling during emulsion xanthation takes place at considerably lower sodium hydroxide concentration in the presence than in the absence of carbon disulfide. 2 tables, 2 figures, and 13 references. E.S.

KLEINERT, THEODOR, and WINCOR, WILHELM. Bound calcium in dissolving pulps and its behavior in the viscose process. I. Influence during the mercerization process. Svensk Papperstidn. 53, no. 20: 638-43 (Oct. 31, 1950). [In German; English and Swedish summaries]

The absorption of calcium by cellulose from dilute solutions containing calcium ions is an ionic reaction which occurs on the carboxyl groups of the cellulose. The carboxyl values obtained from calcium-absorption values are in good agreement with those determined according to Wilson's method (*cf.* B.I.P.C. 18: 508-9). Calcium is absorbed from very dilute solutions; even a prolonged washing of decalcified dissolving pulps with water of medium hardness (7° German hardness) is sufficient to cause the complete saturation of all carboxyl groups with calcium ions. The carboxyl content of spruce sulfite is twice that of beech sulfite pulp. Most of the calcium is bound to the hemicellulose which dissolves during the mercerization process with caustic soda. The alkali-resistant component of the cellulose obtained by mercerization of a calcium-free dissolving pulp (decalcified by treatment with acid) shows only a fraction of the calcium absorption of the original pulp. The α-cellulose of spruce sulfite pulp shows a higher carboxyl content than that of beech sulfite pulp. The calcium which dissolves simultaneously with the hemicellulose during the mercerization of pulps rich in lime is chemically bound to the latter. The calcium-hemicellulose complex in the waste mercerizing liquor can be partly precipitated with alcohol. In the case of beech sulfite pulp, this fraction is found to contain about one calcium-saturated carboxyl group per 50 glucose units, whereas the soluble constituents of the complex have a still higher carboxyl content. The calcium-hemi-

cellulose complex can be separated from the waste mercerizing liquor by dialysis. 6 tables and 21 references. E.S.

SCHWERTASSEK, K. The explanation of dyeing defects of cellulose fibers by means of the iodine sorption. Second communication concerning the relationship of iodine sorption and the state of crystallization of cellulose fibers. Melliand Textilber. 31, no. 11: 764-9 (November, 1950). [In German; English, French, and Spanish summaries] *cf.* abstract below.

A modification of the method used for detecting mercerizing defects by quantitative iodine adsorption (I) can also be applied to the determination of the causes of differential staining of cellulose hydrate fibers. (I) and staining properties (II) are two entirely different processes. (I) is a measure of the interior fiber surface and is not influenced by the number, shape, and size of the pores. (II), on the other hand, are chiefly affected by these three factors; enlargement of the pores tends to increase the diffusion of the dyestuffs into the fibers, whereas a decrease in pore size lowers this rate. (I) is a colloid-chemical criterion of the cellulose, which is influenced by different chemical and physical reactions so that its magnitude varies. The identical reactions may also influence pore size and thereby cause changes in (II). However, certain phenomena influence (I) and pore size or (II) in a different manner, so that (I) can be used for drawing conclusions with regard to the underlying reasons of a differential staining behavior. Various reactions during the manufacture and storage of viscose fibers and their effects upon (I) and (II) are discussed. During deswelling reactions, the author assumes the presence of two processes which proceed in parallel: coagulation and thickening of the amorphous phase, and crystallization and an increase of the crystalline phase; (I) indicates only the latter of the two. 1 table, 4 figures, and 8 references. E.S.

SCHWERTASSEK, K. Recent advances in the theory of mercerization. Melliand Textilber. 31, no. 3: 188-92 (March, 1950). [In German; English, French, and Spanish summaries]

About 20 years ago the author developed a method for the determination of the iodine adsorption (I) of cotton cellulose (*cf.* Melliand Textilber. 12: 457-8 [1931]) for indicating the degree of mercerization and detecting mercerizing defects. In the present article an explanation of the fundamental processes of (I) is attempted. On the basis of x-ray experiments, the author considers (I) a measure of the amorphous constituents of cellulose. The effects of the mercerizing process are ascribed, to a certain extent, to a decrease of the crystalline constituent. The sensitivity of mercerized cotton to hot, wet aftertreatments (such as rinsing, drying, and dyeing) is considered to be the result of (principally) recrystallization processes. The amorphous, hydrated cellulose represents a metastable form which tends to be transformed into the more stable crystalline phase. 2 figures and 14 references. E.S.

RESEARCH

IHLEN, ALF. Technical and natural-science research. Norsk Skogind. 4, no. 10: 285, 287-90 (October, 1950). [In Norwegian]

The author discusses the activities of the research organization board in Norway, Norges Teknisk-Naturvitenskapelige Forskningsråd (NTNF), existing research facilities, and plans for new developments, particularly the centralization of existing units for improving their efficiency and eliminating the duplication of efforts. E.S.

TOMLINSON, G. H., SR. Trends in pulp and paper production from the research angle. Pulp Paper Mag. Can. 51, no. 12: 163, 166-7 (November, 1950).

Following a brief reference to the conditions in the pulp and paper industry in the past century, the author outlines the directions in which the research trends have traveled under the influence of economic changes during the period of his life experience in the industry. The more spectacular advances have occurred in three stages, each being initiated by changing economic conditions. In the first stage, the production of paper was revolutionized through the application of mechanical knowledge and skill; in the second stage, the production of pulp was revolutionized through the application of research and chemical engineering skill. In the third stage, the use of paper has been revolutionized as a result of the developments occurring in the first two stages. The most significant trend in the present pulp and paper production from the research angle is the fact that the pulp and paper mill executives of today have a proper appreciation of the value of research. By further investigations of the fundamentals of papermaking and wood chemistry on the presently intensified scale, research is unquestionably setting the stage for another advance. E.S.

ROOFING FELTS

TARBELL, LESTER J. Coarse papers, roofing and flooring felts. Paper Trade J. 131, no. 22: 308-10 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

SAFETY

BENNETT, W. L. Accident prevention in Quebec's pulp and paper industry. Pulp Paper Mag. Can. 51, no. 12: 224, 226, 228, 230, 232, 234-5 (November, 1950).

The author discusses the Quebec Workmen's Compensation Act, some of the reasons leading to its adoption, and the problems which the Quebec Pulp and Paper Safety Association had to overcome before any progress was made. The Merit System in force in woods operations is outlined, including a new amendment and examples. E.S.

SEMI-CHEMICAL PULPING PROCESS

ANON. Semichem "revolt." Pulp & Paper 24, no. 13: 44-6, 48, 50, 52, 54 (December, 1950).

The conversion of a semikraft board and kraft-paper specialty mill to a semi-chemical pulp and 9-point corrugated board plant at Filer City, Mich. of the American Pulp & Paper Division of the American Box Board Co. is described. The plant uses aspen, which is plentiful in that area, as a raw material and a neutral sodium sulfite process, achieving a yield of 75%; the output is 120 tons of corrugated board per day. Details of the process and equipment are given. The mill supplies the Chicago and Grand Rapids converting plants of the company, which discontinued buying southern corrugating for Chicago and making strawboard in Grand Rapids. 1 flowsheet and 19 illustrations of plant and equipment. E.S.

LIBBY, C. E. High yield pulps from hardwoods. Pulp Paper Mag. Can. 51, no. 12: 125 (November, 1950).

Very brief reference is made to semichemical pulping and the newly developed Chemigroundwood process (*cf.* B.I.P.C. 20: 635-6). E.S.

PERRY, HENRY J. Neutral sulfite semichemical pulping process. Paper Trade J. 131, no. 22: 152, 154, 156-7 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 7 tables, 1 flowsheet, and 4 references. E.S.

SETUP BOXES

FRA. Calculations for cardboard boxes. Allg. Papier-Rundschau no. 20: 994-6 (Oct. 26, 1950). [In German]

An example for calculating the cost of a fancy cardboard box (upright, covered-lid box) in Germany is given. 2 tables. E.S.

FRA. Cost calculations. Allg. Papier-Rundschau no. 18: 903-5 (Sept. 26, 1950). [In German]

A sample calculation of the cost of an ordinary cardboard box (upright lid box) in Germany is given. 2 tables. E.S.

SLIME PREVENTION

MCKEOWN, L. A., and BARDSLEY, J. H. Measurement of slime in a paper mill. Tappi 33, no. 12: 600-2; discussion: 602-3 (December, 1950).

The surface condition of strategic sections in a mill system is an important indication of how well slime is being inhibited from growth on these surfaces. Slime-measuring units using wood panels have been used for this purpose for some time. These wood panels become infected with bacteria and do not necessarily measure the slime-forming ability of the white water or stock. The influence of this infection is corrected by moist-heat sterilization of the wood panel. Concrete panels have been tested and may offer some advantage. The physical characteristics of the panel slime growth are more important than the weight. 5 tables. E.S.

SODIUM CHLORITE

TAKAMATSU, KOICHI, HOSHINO, KAZUO, and HOMMA, TERUO. Sodium chlorite pulping. I. J. Japan. Tech. Assoc. Pulp Paper Ind. 4, no. 5: 9-13, 78-81 (October, 1950). [In Japanese; English summary]

This investigation was prompted by a lack of information in Japan concerning sodium chlorite pulping. The following phases were examined: sodium chlorite pulping of red pine; alkali extraction of holocellulose; influence of beating on several alkali-treated pulps; and purification of semichemical pulp with sodium chlorite. 8 tables, 3 figures, and 6 references. E.G.S.

SOUNDPROOFING

WESTBROOK, FRANCIS A. Stop that noise. Paper & Print 23, no. 3: 294, 296, 298, 301 (Autumn, 1950); *cf.* B.I.P.C. 18: 868-9.

Reduction of factory noise depends on the manner of locating and mounting machines, the type of building, and the use of sound-absorbing material on ceiling and side walls. Resilient mountings under noisy machines break the continuity of vibrations between the machine and the floor. The use of acoustical tile (Acousti-Celotex) has been very effective in deadening noise,

especially where it is objectionable in adjoining offices. Examples from American paper mills and converting plants are given, with particular reference to the Fernstrom Paper Mills, Pomona, Calif. Information obtained from some practical experiments is summarized, and the fact is emphasized that successful measures for noise abatement in industrial plants require the individual study of local conditions. 3 figures. M.W.

STARCH

BARKER, S. A., BOURNE, E. J., PEAT, S., and WILKINSON, I. A. The enzymic synthesis and degradation of starch. Part VIII. The use of mixtures of P- and Q-enzymes in the synthesis of starch-type polysaccharides. J. Chem. Soc.: 3022-7 (November, 1950); *cf.* B.I.P.C. 20: 592.

Different mixtures of stock samples of the P- and Q-enzymes of the potato have been used to catalyze the synthesis of starch-type polysaccharides from glucose 1-phosphate. The properties of the polysaccharide products have been shown to be related to the relative proportions of the two enzymes. When a large excess of P-enzyme was employed, amylose was produced. A large excess of Q-enzyme gave rise to amylopectin. The polysaccharides synthesized by other mixtures of P- and Q-enzymes appeared to have molecular structures intermediate between those of amylose and amylopectin. 5 tables and 1 figure. E.S.

BARKER, S. A., BOURNE, E. J., and WILKINSON, I. A. The enzymic synthesis and degradation of starch. Part IX. Methylation and end-group assay of some synthetic polysaccharides. J. Chem. Soc.: 3027-30 + 1 plate (November, 1950).

Three of the synthetic polysaccharides mentioned in Part VIII have been submitted to methylation and end-group assay, potato amylose (blue value 1.30) and potato amylopectin (blue value 0.19) being used as standards. The average chain lengths thus determined were: amylose, 204; amylopectin, 21; polysaccharide Ia, 150; polysaccharide IV, 19; and polysaccharide V, 17 (all ± 5%). 5 tables and 1 figure. E.S.

CAMPBELL, H. A., HOLLIS, F., JR., and MACALLISTER, R. V. Improved methods for evaluating starch for specific uses. Food Technol. 4, no. 12: 492-6 (December, 1950).

Procedures for the evaluation of starches intended for specific industrial processes are outlined. These procedures are based upon the flow characteristics of slurries of ungelatinized starch, changes which take place in the viscosity and microscopic appearance of starch slurries during a heating cycle, and the susceptibility of starches to amylase action at relatively low temperatures. The interpretation of these measurements and observations is discussed. By adapting the heating, holding, and cooling cycle to the process under investigation, the viscosity changes as recorded by the Brabender amylogram can be used to forecast, with a high degree of confidence, the use characteristics and quality of the finished product. 1 table and 9 figures. E.S.

LOHMAR, ROLLAND, SLOAN, JOHN W., and RIST, C. E. Phosphorylation of starch. J. Am. Chem. Soc. 72, no. 12: 5717-20 (December, 1950).

The authors present a description of the preparation of water-insoluble, nonswelling phosphates of a variety of starches by the reaction of activated starch granules with phosphorus oxychloride in pyridine. It was found that the pretreatment given the starches controlled their reactivity and the nature of the products formed. Starch granules showed increased reactivity after they were heated in pyridine. The reactivity of various species of starch decreased with increased granule size. Characterization of the phosphate linkages in starch phosphates by electrometric titration showed varying amounts of mono-, di-, and triphosphates, depending on the reaction conditions. 2 tables, 1 figure, and 15 footnotes. M.W.

STEAM POWER

ANON. Bird & Son, Inc. recent power plant installations. Paper Mill News 73, no. 49: 49 (Dec. 9, 1950); *cf.* B.I.P.C. 20: 899.

Bird & Son, Inc. has recently installed two new power plants, one for its mill at Shreveport, La., and the other for the main plant in East Walpole, Mass. The power plant of the Shreveport mill consists of a 30,000-pound Riley steam generator, which is fired by natural gas. The East Walpole unit consists of a 175,000-lb./hr. Riley steam generator which has a completely water-cooled furnace and tubular air preheater. This unit is equipped to fire either pulverized coal or oil. 2 illustrations. M.W.

ANON. Central Fibre Products new power plant in operation. Paper Mill News 73, no. 49: 34, 90 (Dec. 9, 1950).

The new power plant of the Central Fibre Products Company at Hutchinson, Kansas, is described. The boiler is of the two-drum design with a completely water-cooled furnace and is equipped with a complete line of recording and indicating instruments. The fuel is natural gas, although oil and pulverized coal may also be fired. Electric power is generated by a new 2400-volt turbine-generator unit. 5 illustrations. M.W.

ANON. Crossett expansion in power plant. Paper Mill News 73, no. 49: 40, 92 (Dec. 9, 1950).

The four power boilers of the power plant of the Crossett Paper Mills, one of which is a new Babcock and Wilcox Type F integral-furnace, water-wall boiler, are fired almost exclusively with natural gas; oil is used in emergencies. A new 200-ton recovery unit with its own precipitator was also recently installed; all five recovery boilers are equipped for firing with oil or gas, so that they can be used as power boilers if their services are not required in chemical recovery. A third Westinghouse turbine generator was added in 1948, so that an average of 7,900,000 pounds of steam and 275,000 kw-hr. of electricity can now be generated and distributed each day. 2 illustrations. E.S.

ANON. Flambeau Paper Company boiler installation. Paper Mill News 73, no. 49: 65-6 (Dec. 9, 1950).

The Flambeau Paper Co. has recently installed a new three-drum Wickes (type B) boiler for coal firing, complete with air-heater. The boiler and its Reintjes floating-type insulation are described. 4 illustrations. M.W.

ANON. New British Columbia power plant burns hog fuel, wet bark. Paper Mill News 73, no. 49: 36-8 (Dec. 9, 1950); *cf.* B.I.P.C. 21: 116.

The description is almost identical with that of the previous reference. 3 figures. E.S.

ANON. Steam generation at Harmac. Paper Mill News 73, no. 49: 68, 88 (Dec. 9, 1950); *cf.* B.I.P.C. 21: 46.

The steam power plant of the new sulfate mill on Vancouver Island is described, which includes three Combustion Engineering boilers for oil or hog fuel, two hog-fuel boilers, and one chemical recovery boiler. An average steam demand of 206,000 pounds per hour is required for the mill. A list of the suppliers of the equipment is appended. M.W.

ANON. Union Bag power plant first high pressure, high-temperature. Paper Mill News 73, no. 49: 28-30, 32 (Dec. 9, 1950).

A description is given of the power plant of the Savannah mill of the Union Bag and Paper Corp., which includes a General Electric steam turbine of the noncondensing type with automatic extraction and admission features, and a Babcock and Wilcox boiler of the radiant type which uses oil or natural gas and, in the future, pulverized coal. 3 charts and 8 illustrations. M.W.

KNY, R. Steam consumption and expenditures for heating, fuel, and overhead in steam-power plant operation. Wochbl. Papierfabr. 78, no. 18: 539-43 (Sept. 30, 1950). [In German]

A simplified method for calculating these factors under given conditions is presented; the results are of sufficient accuracy to facilitate the decision between the generation or purchase of power. 3 tables and 2 diagrams. E.S.

RIDINGS, ROBERT C. The effect of paper machine demand on power production. Paper Mill News 73, no. 49: 58, 60, 62, 94 (Dec. 9, 1950).

The author presents the development of a purely imaginary power-plant arrangement to meet the demands of a paper mill, shows the influence of prevailing mill conditions on this arrangement, and examines the effects of varying paper-machine demands on power plant operation. 1 diagram. M.W.

STR. The cleaning of boilers fouled by contact with flue gases with ammonia vapors according to the method by Hutter. Wochbl. Papierfabr. 78, no. 21: 633-5 (Nov. 15, 1950). [In German]

The author discusses the advantages of the Hutter procedure (German patent 757,314) for cleaning the heating surfaces of a boiler fouled by contact with flue gases with a mixture of steam and ammonia vapor, followed by a preservation treatment with an oil-graphite emulsion. The fact is emphasized that a satisfactory boiler-cleaning procedure does not insure the economy of the steam-plant operation; all possibilities for preventing the rapid soiling of a boiler should be carefully investigated. 1 diagram and 5 references. E.S.

STRAINS AND STRESSES

LHOMME, H. Tensile testing. Papeterie 72, no. 10: 541, 543 (October, 1950). [In French]

A very brief discussion is given of the load-elongation properties of materials subjected to the slow application of stresses. 1 graph. S.S.

STRAW

DUCÉ, R. Straw—bane or boon? Paper-Maker (London) 120, no. 5: 330-1, 358 (November, 1950).

The author discusses the economic and general aspects of straw as a raw material for papermaking, particularly with regard to Great Britain. Certain difficulties have to be overcome; however, what is needed most is a spirit of attack and determination to overcome these difficulties, and the problems will be solved. E.S.

STRAW—WASTE LIQUOR

BLOODGOOD, D. E., KINNAMAN, J. F., and COLEMAN, R. D. Wastes from the processing of a bale of straw. Proc. 4th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 68: 266-77 (July, 1949).

The purpose of this study was the determination of the pollution potential of the various screened portions of a typical straw bale, the percentage of each screened portion that goes into paper or waste, and the percentage of the total paper that can be recovered from each processed portion. These studies showed that straw (grades 0+20) which made up 88.9% of the bale produced 94.5% of the paper, but only 79.2% of the waste solids and 83.8% of the total potential B.O.D. If the original straw could be cleaned before use, there would be an appreciable reduction in the waste-disposal problem. The waste solids from a bale of straw amount to 37.3% of the bale weight. If segregation or screening of straw could be practiced for a 100-ton mill, it would mean a saving in treatment-plant cost equivalent to that required to build a sewage plant for a city of 13,300. 8 tables, 1 flowsheet, and 1 reference. E.S.

ERGANIAN, GEORGE, and HARGLEROAD, JAMES C. Strawboard waste disposal research. Proc. 3d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 64: 65-73 (November, 1947).

Investigations at Purdue University under the sponsorship of the National Council for Stream Improvement are reviewed, including the identification of sources which contribute to the total strawboard-mill waste (rotary wastes, primary and secondary beater wastes, and machine water), their B.O.D. and solids concentration, and possible treatments (anaerobic digestion), and an analysis of the chaff and dirt in a straw bale and its contribution to the pollution load. 2 tables and 1 figure. E.S.

LARDIERI, NICHOLAS J. Organic constituents of strawboard waste. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 296-304 (July, 1950).

An investigation was made of the organic constituents and properties of rotary waste liquor from the manufacture of strawboard. It was found that the pentosanic compounds compose 18% of the dry rotary liquor solids and that pentoses were not present in the waste. The biological significance of these results is pointed out. Preliminary laboratory B.O.D. tests showed that the biological breakdown of lignin, which comprises 10.1% of dry rotary liquor solids, proceeds slowly. Molds seemed to grow well in rotary waste

liquor; the growth of *Ermothecium ashbyii*, the mold used in the commercial production of riboflavin, is being investigated. 18 references. M.W.

STREAM POLLUTION

DOUTT, F. V. Pulp and paper mill wastes. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 338-44 (July, 1950).

The present outlook for the stream-pollution problem of the paper industry is brighter because of the development of salable by-products from sulfite waste liquor, the use of this waste as fuel by at least one major mill, and the fact that little new expansion is being carried on for the sulfite process, which is the worst offender as far as pollution is concerned. The effects of wastes from the various pulping, bleaching, deinking, and papermaking wastes on streams are outlined and possible remedies are suggested. It is pointed out that the paper industry is exerting considerable effort to alleviate the pollution problem. M.W.

ESSEN, CARL GUSTAV VON. The water pollution problem of sulfate mills. Svensk Papperstidn. 53, no. 21: 690-3 (Nov. 15, 1950). [In Swedish; English summary]

Reference is made to the fact that water pollution caused by sulfate mills cannot be determined in the same manner as that from sulfite pulp and paper mills by the determination of the pH, B.O.D., and permanganate consumption of the water. The present tests with fish have the great disadvantage that they cannot be applied to routine mill control. The urgent need for the development of appropriate testing procedures is stressed. The two sources of pollution from sulfate mills are the different condensates (I) and the effluent from the diffuser and screening rooms (II). Developments in Swedish sulfate mills for the reduction of water pollution from these two sources are discussed. Data indicate that during recent years the proportion of (I) in stream pollution has increased, whereas that of (II) decreased. However, conditions in sulfate mills vary to such an extent that no generally applicable treatment is possible; each mill must be considered individually. With regard to (I), the installation of a Bergström oxidation tower in a sulfate mill is mentioned; the aerated condensate is pumped to basins where it is mixed with lime sludge, resulting in an 80% reduction of the toxic substances. Even the simple mixing of condensate and lime sludge produces satisfactory results. In the case of (II), improved washing techniques are listed, as well as relatively simple oxidation basins from which the rosin acids are skimmed prior to the discharge of the waste water to the river. Improved evaporation techniques, particularly the increase in the number of effects, has resulted in a noticeable decrease of the toxic substances from the evaporator condensate. All condensate from the heating elements is utilized in the causticizing room for the washing of lime sludge and for the preparation of white liquor. Only the highly diluted effluent from the jet condenser is discharged; although this may not be toxic to fish, it has a strong odor and may impair the taste and odor of fish so that they are no longer fit for human consumption. This condensate might first be treated in a Bergström tower, but this treatment is liable to convert the water-pollution into an air-pollution problem. Modern causticizing installations are taking care of the lime-sludge problem; its disposal plays a role in only a few very old mills. In the treatment of by-products, the deposits in the manufacture of tall oil used to cause concern; however, this problem has been solved because all mills now burn these deposits. 2 tables and 1 figure. E.S.

HORTON, ROBERT K. Pollution-capacity studies of the Wabash River. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 330-7 (July, 1950).

A summary of the purpose, objectives, and methods of a pollution-capacity study of the Wabash River is given. M.W.

KITTRELL, F. W. Pulp and paper mill wastes in the Tennessee Valley. Proc. 4th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 68: 32-9 (July, 1949).

A brief review is given of the stream pollution problems with which the nine pulp and paper mills (two soda pulp and paper mills, three semi-chemical chestnut pulp and paperboard mills, one semichemical pulp and paper mill, two waste-paper board mills, and one large pulp and paper mill, using sulfite, kraft, and soda processes) in the Tennessee Valley are faced, and the action taken or planned by these mills for the reduction of the pollution load. Despite great progress made by some mills, much still remains to be done; the color problem is particularly urgent. 1 table. E.S.

KLINE, HUBERT S. Samplers for industrial-waste surveys. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 191-202 (July, 1950).

Sampling is interpreted to include means for obtaining samples and the direct indication of the chemical nature of the flowing waste. In this paper, therefore, flow measurement and pH measurement are discussed, as well as sampling methods. The flow methods which are described are: (1) timing method, (2) volume measurement, (3) weirs, (4) flumes, (5) the orifice meter, and (6) the venturi meter. A brief discussion of each of the following sampling methods is presented: (1) "catch" or "grab" sampling, (2) scoop-type devices, (3) proportioning or chemical-feed pumps, (4) solenoid-valve arrangements, and (5) measuring-cup distributing apparatus. As a composite example of the principles discussed, the paper concludes with a description of the sampling station used in connection with the Frigidaire industrial-waste control program. 6 references. M.W.

MATAGRIN, AM. The chemical treatment of white waters in the American paper industry. Papeterie 72, no. 9: 477, 479, 481, 484-5 (September, 1950). [In French]

This is a review of the work being done in the United States in an attempt to eliminate stream pollution and effect the recovery of fibrous materials from mill effluents. 12 references. S.S.

MORGAN, PHILIP F. The determination of the type and degree of treatment required for an industrial waste problem. Proc. 3d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 64: 74-84 (November, 1947).

The author describes the details of the survey of the critically polluted section of the Kalamazoo River from Comstock to Williams Bridge, a distance of 34.5 miles, for providing the basic information required for computing the deoxygenation and reoxygenation coefficients of the river and the degree of waste treatment required to obtain the necessary improvement in the oxygen level. The work included a survey of the quantity and quality of all wastes entering the river, both industrial and domestic, and a conventional stream survey during the summer to determine oxygen levels and

demands. The work was carried out as a joint project of the Michigan Stream Control Commission and the National Council for Stream Improvement to provide the basic data for the deinking-waste studies in the Kalamazoo laboratory established by the Council. 6 figures. E.S.

NORD, MELVIN. Stream pollution, its prevention and control. Chem. Inds. 67, no. 6: 893-6, 904 (December, 1950).

The problem of stream pollution is discussed under the following headings: (1) types of stream pollution, (2) stream sanitation, (3) dispersion of waste effluents, and (4) treatment of wastes. The methods of treatment described include mechanical and hydraulic separation, chemical coagulation, chemical and physical reaction, disinfection, and biological reaction. 1 table, 1 figure, and 24 references. M.W.

NORD, MELVIN. What the law says. Chem. Inds. 67, no. 6: 897-8 (December, 1950).

Answers are given to a series of questions concerning riparian rights in connection with the pollution problem. Some of the aspects considered include the apportionment of riparian rights, the "reasonable user" doctrine, the "prior appropriation" rule, the situation regarding pollution, liability under the nuisance doctrine, the scope of the Federal pollution statute, etc. 5 references. M.W.

PATRICK, RUTH. A proposed biological measure of stream conditions. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 379-99 (July, 1950).

The proposed measure of stream conditions is based on the premise that a measure of the biodynamic cycle (the balanced physiological activities of aquatic life in surface waters) is the most direct indication of the condition of a stream. The chemical and physical characteristics of normal streams vary widely and cannot be reduced to a simple standard, and there is no practical means of testing for all possible toxic agents. The biological measure, which uses largely the organisms that are attached to the bottom or edges of the stream, will reflect the conditions of the water which has flowed past a given point for a considerable time before sampling, whereas a chemical analysis can reveal only the condition at the exact time the sample was taken. This paper was based on a study of the Conestoga Basin of Pennsylvania. 1 table, 1 figure, and 9 references. M.W.

ROHLICH, G. A., and INGERSOLL, A. C. Laboratory experiments on the behavior of gravity separators. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 203-14 (July, 1950).

An explanation is given of the principles of gravity separation and the interpretation of dispersion curves. Some results of tests carried on by the Committee on Refinery Waste Disposal of the American Petroleum Institute at the University of Wisconsin Hydraulic Laboratory are presented. They indicate that the dispersion testing method presents a means of determining the hydraulic behavior of separating chambers and is a valuable tool in comparing and evaluating different types of tanks. 1 table, 5 figures, and 3 references. M.W.

STAHL, B. FRANKLIN. What can you learn with a pilot plant? Proc. 3d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 64: 85-90 (November, 1947).

The author describes the pilot-plant studies with a Spaulding precipitator and a trickling filter, the results of which indicated that the combination of the two treatments would not meet satisfactorily the requirements for complete waste treatment of the paper mill at Terre Haute, Ind. 2 tables and 2 figures. E.S.

VAN HORN, WILLIS M. The biological indices of stream quality. Proc. 5th Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 72: 215-22 (July, 1950).

The nature and uses of biological indices, in both field and laboratory studies, are described. Such indices are of use if their advantages and disadvantages are well understood. Their optimum use, however, can be of value only if the resulting data are applied and interpreted with common sense and understanding. 6 references. M.W.

SULFATE MILLS

ANON. International Paper Company starts dissolving pulp operations in Mississippi; hardwood changed to dissolving pulp by sulphate process. Southern Pulp Paper Manuf. 13, no. 12: 38, 40, 42, 44-5, 47-8, 50, 52, 54 (December, 1950); *cf.* B.I.P.C. 21: 117.

A profusely illustrated description of the new sulfate mill at Natchez is given. E.S.

SULFITE PROCESS

CAULFIELD, J. G. L. Sulfite pulping, general. Paper Trade J. 131, no. 22: 125-6, 128, 130-1 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 4 figures and 1 flowsheet. E.S.

SULFITE WASTE LIQUOR

JENSEN, WALDEMAR. Investigation of the fusel oil obtained in the production of alcohol from sulfite waste liquor. I. Paper and Timber (Finland) 32, no. 11: 329-32 (November, 1950). [In Swedish; English summary]

The author investigated a sample of fusel oil obtained from the sulfite alcohol plant at Mänttä and isolated a new constant-boiling fraction by distillation in a spinning-band column according to Björkman and Olavi (*cf.* Svensk Kem. Tid. 58:145-50 [1946]). This fraction boiled at 129°C. at 15 mm. and at 146.5° at 32 mm. of mercury, and at 249.8-250.5° at atmospheric pressure. It was found to be an azeotropic mixture which contained 3-methoxy-4-hydroxypropylbenzene as one of the principal components; it was identified through its 3,5-dinitrobenzoate. Another component of a very similar structure is probably present in the fraction. The studies are being continued. 2 tables, 5 figures, and 7 references. E.S.

SCHOLANDER, AXEL. The precipitation of calcium sulfate from supersaturated sulfite waste liquor. Svensk Papperstidn. 53, no. 21: 681-9 (Nov. 15, 1950). [In Swedish; English summary]

A study of the waste liquor displacement process has shown that better results are obtained when the liquor is recovered in pits or diffuserlike arrangements outside the digester. However, the temperature will thereby be lowered and the sulfate content of the liquor increased to the extent that it will become supersaturated with calcium sulfate. As a consequence, severe

scaling troubles may be encountered in the alcohol and evaporator plants. Desupersaturation by seeding has been studied for water solutions and waste liquors. In the first case, desupersaturation is furthered by high temperature, good agitation, and a high concentration of the seeding substance. Best results were obtained with calcium sulfate dihydrate (I); secondary precipitation of (I) was obtained when other inoculating agents were used. The effect of ultrasonic treatment on the precipitation was studied, but the results were not promising. From the study of waste liquors, results similar to those with water were obtained. In this case, however, the pH of the liquor becomes an important factor, as previous investigators have shown. Desupersaturation was studied as a function of temperature, seeding substance (I), concentration, and pH; the most favorable conditions were high temperature, high concentration of seeding substance, vigorous stirring, and a pH of 3. Sulfate concentrations as low as 1.1 grams/liter can be reached. A high initial sulfate concentration is beneficial, as it causes the precipitation of many fine seeding particles in the liquor. The process has been studied on a semicommercial scale. The results are presented in tabular form and show that the process should preferably be carried out in connection with the neutralization of the liquor. Good results will be obtained if the neutralization is carried out in two steps according to H. Vogt (Swedish patent 120,794 [Feb. 3, 1948]). The first step includes seeding at a pH of 3, and the second step involves the final neutralization. Whether or not a sedimentation process between the two steps is necessary will depend upon the conditions in the second step. If the pH of the liquor is not raised above 5 and moderate stirring is employed, the danger of redissolving the precipitated sulfate is slight. The resulting liquor will not be saturated, so that its temperature can be raised in the distilling plant with little risk of scale formation. The technical significance of the process is discussed. 16 tables, 9 figures, and 10 references. E.S.

WAESER, BRUNO. Recent methods for the utilization of lignin and sulfite waste liquor. Chem.-Ztg. 74, no. 45: 679-81 (Nov. 9, 1950). [In German]

A review with 47 references is presented. E.S.

SWELLING AND HYDRATION

BARKAS, W. W. The swelling of wood under stress (1-5). Svensk Papperstidn. 53, no. 14: 385-96; no. 15: 431-9; no. 16: 465-83; no. 17: 509-17; no. 18: 543-50 (July 31, Aug. 15, 31, Sept. 15, 30, 1950). [In English; Swedish and German summaries]

In a series of five articles the author discusses the results of his 15 years of research on the elasticity, plasticity, and swelling of wood and wood fibers, performed at the Forest Products Research Laboratory, Princes Risborough, England. The introductory material includes considerations of anistropy, the ideal fiber, sorption, properties of adsorbed moisture, swelling of gels, capillary stress, and anisotropic elasticity. The development of the theory originated from the belief that since wood is capable of exerting stresses during swelling, there must be some connection between the hygroscopicity and the elastic constants of the material. It was found that the subject could be treated by thermodynamics, and hence the results are perfectly general and applicable to any swelling material, e.g., paper, which absorbs any volatile liquid. The swelling pressure equations of Katz and Porter are discussed. Reasons for the failure of the former to give a satisfactory agreement with experiments are presented. The corresponding Porter equation (based on osmotic pressure considerations) is shown to be capable

of generalization by means of thermodynamics to cover directional stresses, such as occur during the swelling of wood. Thus, from the vapor pressure and the moisture content under stress, the swelling stress exerted by a plastic gel may be obtained. Discussion of frictional plasticity leads to a digression concerning an explanation for the large increase in wet strength resulting from the addition of small percentages of synthetic resins to paper. Sorption hysteresis is discussed, and the theory of plastic sorption is shown to predict a volume hysteresis in swelling when plotted against moisture content. The predicted values are of the same order as those obtained from experiments. 11 tables, 38 figures, and 42 references. J.O.T.

TANNINS

ROGERS, J. S., CALDERWOOD, H. N., and BEEBE, C. W. Study of the tannin contents of barks from the Florida scrub oaks *Quercus laevis* and *Q. cinerea*. J. Am. Leather Chemists Assoc. 45, no. 11: 733-51 (November, 1950).

A report is given of a co-operative research project of the Eastern Regional Laboratory of the United States Department of Agriculture and the Engineering and Industrial Experiment Station of the University of Florida. A study of barks from tree trunks from six plots of *Quercus laevis* showed (on a moisture-free basis) an average tannin content of 10.5% and a purity of 58.8% as compared with an average of 6.7% of tannin and a purity of 56.0% for barks from one plot of *Q. cinerea*. No correlation was found between tannin contents of barks and ages or diameters of trees in either case. Seasonal variations were not studied in detail, but some samples indicated there might be an optimum time for bark collection. Results of the investigation indicate that from average stands of *Quercus laevis*, yields of about one ton of 25% tannin extract should be possible per acre, and that the tannin is suitable in quality for the production of tanning extracts. 10 tables, 7 figures, and 28 references. M.W.

TESTING, GENERAL

BACHMANN, A. E. The challenge to testing. Tappi 33, no. 12: 24A, 26A, 28A (December, 1950).

TAPPI has now reached the position of some substantial degree of maturity with respect to testing. The author discusses the directions in which future steps should be taken, particularly the ascertainment of the extent to which the standards are actually adopted and in case they are not, the reasons for the substitution of other methods. If the TAPPI committees succeed in developing a universally used language of common tests, common units, and the proper interpretation of them in terms of specific paper quality, a basis will have been provided for a start toward the next important step, the formulation of general papermaking principles. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Testing Division*. Testing Conference. Tappi 33, no. 12: 74-90A (December, 1950).

The following reports of the Testing Conference have been prepared by the chairmen of the participating committees and are listed by authors and titles: Clark, James d'A. Testing, the path of progress, p. 74-6A; Fillius, Milton F. Chemical Methods Committee—1 reference, p. 76-80A; Forman, Loren V. Pulp Testing Committee, p. 80-4A; Brandon, C. E. Microscopy Committee, p. 84-5A; Casey, James P. Nonfibrous Materials Testing Com-

mittee, p. 85-6A; Croup, A. H. Optical Properties Committee, p. 86-7A; Simerl, L. E. Packaging Materials Testing Committee, p. 87-8A; Warner, A. Kenneth, Paper Testing Committee, p. 88A; Heald, A. M. TAPPI-A.S.T.M. Technical Committee on Petroleum Wax, p. 88-90A; Balster, W. J. Container Testing Committee, p. 90A. E.S.

TESTING, GENERAL—PAPER

REID, LEWIS S. Paper testing and specifications. Paper Trade J. 131, no. 22: 324, 326, 328-32, 335 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

WASTE

ANON. More mileage from materials. Modern Packaging 24, no. 4: 77-82, 186, 189 (December, 1950).

A review of some of the practices used during the last war to conserve packaging materials is presented. Some specific examples of waste elimination (reduction of roll widths and machine cutoff, use of correct sheet sizes and minimum overlap) and suggestions for storing and shipping are given, and the use of substitutes is discussed. 1 table and 9 illustrations. M.W.

WASTE PAPER

MUNDS. Report of the meeting of the Papier-Verein von Hessen concerning the wet stock preparation of waste papers. Wochbl. Papierfabr. 78, no. 21: 631-3 (Nov. 15, 1950). [In German]

A report of the meeting (held near Darmstadt on Oct. 25-26, 1950) is given; abstracts of the papers presented at that time are included. E.S.

WHITE WATER

KOCH, HAROLD C. Things that bother me about the disposal of wastes from the paper industry. Proc. 3d Ind. Waste Conf.; Purdue Univ., Eng. Bull., Extension Ser. no. 64: 91-7 (November, 1947).

The author discusses some of the drawbacks of a closed white-water system in a mill starting with prepared pulps and waste papers and converting these into finished products; he emphasizes the fact that the large savings calculated for attractive recirculation designs prepared in the drafting room cannot always be realized in practice, and that difficulties and obstacles will have to be overcome. These include slime problems, excessively high temperatures for correct hydration and sizing operations, the effect of fine fibers on white water drainage from the wire and operation of the paper machine and their influence upon paper quality, particularly in the case of fine papers which have to meet high standards of brightness and cleanliness, and increased corrosion of stock. The operating difficulties multiply until a point is reached when it must be concluded that recirculation has been carried too far; the complete closing of a system for waste elimination is not practical. E.S.

WOOD—EXTRACTIVES

KURTH, E. F. Methyl ester of dehydroperillic acid, an odoriferous constituent of western red cedar (*Thuja plicata*). J. Am. Chem. Soc. 72, no. 12: 578-9 (December, 1950); *cf.* B.I.P.C. 19: 511.

An investigation of some highly fragrant crystals found in western red-cedar disclosed that they were the methyl ester of dehydroperillic acid. This compound is readily saponified with dilute alkalies to dehydroperillic acid, and since the former workers used alkalies in their isolation of the acid, the methyl ester was not recognized as the chief odoriferous constituent of *Thuja plicata*. Some of the physical properties of the compound are reported. 2 footnotes. M.W.

WOOD—STRUCTURE

HYLAND, FAY. The structure of wood. Paper Trade J. 131, no. 22: 87, 90-4, 96-8 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 11 figures. E.S.

WOOD OPERATIONS

BIRCH, E. W. Rock drilling experience of the Donnacona Paper Company Limited on the Jacques Cartier River. Pulp Paper Mag. Can. 51, no. 12: 154, 156 (November, 1950).

Data on the company's experience during the last three years with threaded drill rolls and Coromant drills for road construction, dam building, clearing and mining streams, etc., mostly under very rugged conditions, are given. 3 tables. E.S.

DEMERITT, DWIGHT B. A brief summary of pulpwood production in the Northeast. Paper Trade J. 131, no. 22: 108-9 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. E.S.

WOOD ROOM

REDDEN, C. A. The wood room. Paper Trade J. 131, no. 22: 109-12, 114 (Nov. 30, 1950).

This is one of a series of industrial lectures on pulp and paper manufacture presented at the University of Maine. 9 figures. E.S.

WOOD WASTE

BORGIN, KARL. A review of new uses of waste and by-products from forests and the pulp industry in the United States. Norsk Skogind. 4, no. 10: 277-84 (October, 1950). [In Norwegian; English summary]

The author discusses the use of wood waste hitherto discarded, lignin plastics, wood saccharification, the hydrogenation of lignin, and efforts for utilizing sulfite waste liquor or certain of its constituents, with particular reference to the manufacture of vanillin. 6 figures and 27 references. E.S.

RISI, J. Ammonia fertilizers from wood waste. Can. Chem. Process Inds. 34, no. 12: 972-4 (December, 1950).

A process developed and successfully carried out in India for producing ammonia fertilizers from wood waste is described. The wood waste is used as a source of producer gas which is employed as the reducer in the steam-

iron method for hydrogen production. Nitrogen is obtained from the spent gases from the hydrogen generation, supplemented by direct combustion of producer gas. Carbon dioxide, required for the conversion of ammonium sulfate by the gypsum process, is obtained from scrubber solutions enriched by the absorption of more carbon dioxide from burned, spent reducing gases. The application of the process under Canadian conditions is discussed, and the possibility of the production of synthetic ammonia by pulp and paper mills for use in the ammonium bisulfite process of pulp production is suggested. A brief discussion is given of a project based on the use of Lacotte generators rather than the steam-iron method. In this method, oxygen-enriched air, which would require an air-liquefaction plant, would be used, and in addition to ammonia, pure oxygen and nitrogen could also be produced. An appended table furnishes fundamental information for an actual project where 66 tons of wood waste per day would be available. 1 table, 4 figures, and 3 references. M.W.

X-RAY RESEARCH—SMALL-ANGLE SCATTERING

HEYN, A. N. J. A quantitative evaluation of small-angle x-ray scattering by various cellulose fibers for the determination of crystallite size with special reference to the problem of inter-particle interference. J. Am. Chem. Soc. 72, no. 12: 5768-70 (December, 1950); *cf.* B.I.P.C. 20: 752.

The previous reference concerns the qualitative evaluation of the scattering of x-rays by various cellulose fibers. In this paper the scattering is considered on a quantitative basis. It was found that although in the dry state the simple approximation formulas given by Guinier could not be applied because of the "densely packed systems," the swelling of the fibers in the wet state so increases the distance between the particles that interparticle interference no longer plays a part, and it is possible to use the Guinier formulas for the calculation of particle size. The results so obtained are reported. 1 table, 5 figures, and 4 footnotes. M.W.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ALKALINE PROCESSES

TARKKONEN, OMA. Methods of procedure in the production of sulphate pulp. Canadian patent 470,091. Filed Feb. 1, 1947. Issued Dec. 12, 1950. 4 claims. Assigned one half to Sunila Osakeyhtiö.

The heat content and pressure of the black liquor from a preceding run are utilized by introducing the black liquor, still under pressure, into the digester together with the chips; during the charging operation virtually the entire charge of chips becomes impregnated with the liquor. The amount of white liquor necessary for carrying out the cook is subsequently introduced into the digester. E.G.S.

BARK

GUNDERSON, LEWIS O. Method of and composition for inhibiting foaming in steam boilers. U. S. patent 2,534,441. Filed March 19, 1945. Issued Dec. 19, 1950. 8 claims. Assigned to Dearborn Chemical Company. [Cl. 252-321]

Redwood-bark dust or alkali derivatives of redwood bark are incorporated in boiler water to disperse and/or solubilize sludge and to prevent or lessen the encrustation of the boiler surfaces with hard deposits of calcium or magnesium salts; the redwood substance also serves to increase the efficiency of foam-inhibiting compositions. The method is particularly applicable to the treatment of water used in the generation of high-pressure steam, for instance, in locomotive boilers, where the generated steam pressure may exceed 100-200 p.s.i. E.G.S.

BLACK LIQUOR

VON HILDEBRANDT, PAUL G. Process for separating cooking liquor from pulp. U. S. patent 2,534,324. Filed July 2, 1945. Issued Dec. 19, 1950. 8 claims. [Cl. 8-156]

A process and apparatus are provided in which the cooking liquor is separated from pulp with a minimum of water dilution, thereby reducing the foaming and the heat required for evaporating the black liquor for subsequent burning. 12 figures. E.G.S.

BOARD, CORROSION-INHIBITING (VPI)

HUTTER, CLEMENS A. Carton having metal corrosion inhibiting characteristics. U. S. patent 2,534,201. Filed Nov. 1, 1949. Issued Dec. 12, 1950. 9 claims. Assigned to Nox-Rust Chemical Co. [Cl. 229-3.5]

The inner wall of a paper packaging material for metal parts is impregnated with a corrosion-inhibiting composition which comprises one part by weight of an inorganic metal nitrite (e.g., sodium, potassium, or lithium nitrite) and 0.05-20 parts by weight of an amide (e.g., acetamide, propionamide, stearamide, urea, guanidine, biuret, and the like). 4 figures.
E.G.S.

BOARD SPECIALTIES

BELANGER, ALBERT P. D. Winding spool. U. S. patent 2,532,658. Filed Sept. 13, 1947. Issued Dec. 5, 1950. 4 claims. Assigned to Alton Box Board Company. [Cl. 242-118; changed to 242-119]

A winding spool for cord, yarn, wire, or the like comprises a paperboard, cup-shaped structure which is provided with parallel side-wall sections designed to hold successive turns of the wound material around the body of the cup. 3 figures. E.G.S.

BLAIR, FLETCHER. Collapsible box. U. S. patent 2,534,402. Filed Jan. 10, 1947. Issued Dec. 19, 1950. 1 claim. [Cl. 229-6; changed to 229-41]

A display container for foods in bulk form (e.g., crackers, cookies, and the like) is provided with a movable bottom which can be inserted from the top of the box and locked into upwardly and inwardly flared flanges on the sides of the box. The sides are also formed with partly severed, spaced tongues which are adapted to be pressed inwardly when the box is partially empty so as to support the bottom in a raised position. 4 figures.
E.G.S.

BUICK, JOHN A. Pull match package. U. S. patent 2,532,440. Filed Oct. 10, 1947. Issued Dec. 5, 1950. 3 claims. [Cl. 206-29]

A pull-match package incorporates at least two separate sheets of paper matches, which are held frictionally in the cover of the package on opposite sides of a separator secured to the cover. 4 figures. E.G.S.

BURR, NED. Folding display. U. S. patent 2,533,874. Filed July 9, 1945. Issued Dec. 12, 1950. 5 claims. Assigned to Chicago Cardboard Company. [Cl. 40-152.1; changed to 40-125]

A folding cardboard display structure incorporates panels which are supported at different angles and a folding part which is pivoted to one panel and adapted to make an angular connection with another panel. 14 figures.
E.G.S.

COCHRANE, LOUIS W. Cup-carrying tray. U. S. patent 2,533,997. Filed Aug. 23, 1948. Issued Dec. 12, 1950. 3 claims. Assigned to United Board & Carton Corporation. [Cl. 224-48]

The portions of a cardboard, cup-carrying tray which are cut away to form cup-receiving apertures are employed as a handle for carrying the tray. 2 figures. E.G.S.

EPPS, THOMAS B. Storage and display boxes. Canadian patent 469,804. Filed Oct. 20, 1948. Issued Dec. 5, 1950. 3 claims.

This is the same as U. S. patent 2,457,812; *cf.* B.I.P.C. 20: 443. E.G.S.

FOURNESS, CHARLES A. Tampon applicators. Canadian patent 469,554. Filed Oct. 11, 1947. Issued Nov. 21, 1950. 7 claims. Assigned to International Cellucotton Products Company.

The two tube elements of a tampon applicator are locked together against separation, and at the same time the free slidability of the ejector tube within the inner tube is preserved. 3 figures. E.G.S.

FRYE, DE MOINE H. Re-usable pallet bin. U. S. patent 2,534,010. Filed April 26, 1946. Issued Dec. 12, 1950. 3 claims. Assigned to Leslie T. Swallow. [Cl. 229-23]

A re-usable shipping and storage carton comprises separate interlocking sections which are constructed in such a manner that several of the cartons can be stacked together to provide a multilayer shipping and storage bin. 3 figures. E.G.S.

FRYE, DE MOINE H. Re-usable pallet bin. U. S. patent 2,534,011. Filed July 25, 1946. Issued Dec. 12, 1950. 2 claims. Assigned to Leslie T. Swallow. [Cl. 229-23]

A re-usable shipping and storage bin is formed of fiberboard or the like and can be assembled in any desired size by the addition or removal of a selected number of sections. The empty and disassembled sections can be folded or collapsed into compact bundles for shipment. 6 figures. E.G.S.

GRINNELL, GEORGE G. Foldable tray blank and tray. U. S. patent 2,532,808. Filed Nov. 5, 1948. Issued Dec. 5, 1950. 6 claims. [Cl. 229-31]

A folded paperboard tray is adapted for the packaging and distribution of tomatoes and other fruit. After the fruit has been packed in the tray, a sheet of cellophane is attached to the end flaps and side walls to cover the fruit. 7 figures. E.G.S.

HALL, MAYNARD G. Bottle carrier. U. S. patent 2,532,446. Filed Oct. 2, 1947. Issued Dec. 5, 1950. 7 claims. Assigned to Empire Box Corporation. [Cl. 229-28]

A collapsible, multicompartment cardboard bottle carrier incorporates central bottle separators, two of which function as handle sections. 17 figures. E.G.S.

JACOBSON, MORRIS. Collapsible hat holder. U. S. patent 2,535,136. Filed Nov. 19, 1945. Issued Dec. 26, 1950. 1 claim. Assigned to Arvey Corporation. [Cl. 211-32]

A collapsible, cardboard hat holder embodies back sections and hat-receiving members which are assembled by means of connecting links to provide means for holding a predetermined number of hats. 4 figures. E.G.S.

MOORE, GEORGE A. Display package and tray. U. S. patent 2,533,738. Filed Sept. 5, 1945. Issued Dec. 12, 1950. 3 claims. Assigned to National Biscuit Company. [Cl. 206-45.33]

A display package for cookies, wafers, sandwiches, and the like consists of a cardboard boat which is enclosed in a heat-sealed cellophane wrapper. The upturned ends of the boat serve to hold the surface of the cellophane smooth and taut over the packaged articles; the ends are prevented from turning in during the heat-sealing operation by braces which are formed from the material of the boat. 5 figures. E.G.S.

PAOLANTONIO, ANTONIO. Package for knives. U. S. patent 2,535,229. Filed March 2, 1949. Issued Dec. 26, 1950. 1 claim. Assigned to Colonial Knife Company, Inc. [Cl. 206-78; changed to 206-80]

A cardboard display card for pocket knives is provided with a number of elastic straps which are located in such positions that knives may be placed beneath two such straps and held on the card. 5 figures. E.G.S.

ROACH, EARL M. Collapsible step display. U. S. patent 2,535,160. Filed April 6, 1946. Issued Dec. 26, 1950. 2 claims. Assigned to Arvey Corporation. [Cl. 248-195; changed to 248-198]

A collapsible cardboard step display is adapted to be supported in its extended position by means of a single- or double-wing easel. 6 figures. E.G.S.

TOMARIN, HARRY A. Support shield for hangers. U. S. patent 2,534,081. Filed March 18, 1948. Issued Dec. 12, 1950. 4 claims. Assigned to Loroco Industries Incorporated. [Cl. 223-88]

A cardboard support for a wire garment hanger embodies means for locking it to the hanger against accidental displacement therefrom. 6 figures. E.G.S.

VIVIAN, GEORGE S. Resealable carton closure having metallic clip fastening means. U. S. patent 2,533,539. Filed July 17, 1945. Issued Dec. 12, 1950. 1 claim. Assigned to Satona Limited. [Cl. 229-65]

A method of sealing cartons or containers with wedgelike, pleated tops consists in forming an abutment along one side of the top and applying a resilient, metallic, U-section clip or split tube over the peak of the top. A longitudinal edge of the clip engages the abutment to effect a snap-locking and closure action. 6 figures. E.G.S.

BONDED FIBER WEBS

KILHAM, PETER. Method and apparatus for applying adhesive to fibrous webs. U. S. patent 2,533,167. Filed June 27, 1947. Issued Dec. 5, 1950. 13 claims. Assigned to American Reenforced Paper Company. [Cl. 117-65]

A method and apparatus are described for the application of an adhesive to a web of loose, unspun fibers (e.g., sisal, jute, cotton, wool, rayon, or the like). A web of attenuated and generally parallel fibers is advanced over, but out of contact with, a supply of adhesive; immersed in the adhesive is a perforated pipe through which air flows into and upwardly through the adhesive to form, on the surface of the adhesive, a mass of light frothy bubbles which rise upwardly into contact with the web. The bubbles are so fragile that they burst readily upon contact with the fibers and deposit the adhesive sparingly and uniformly without disturbing the fiber arrangement. The fibrous web is dried by passage over a heated cylinder. 15 figures. E.G.S.

CHLORINE DIOXIDE

SEVÓN, JOHAN W., and SUNDMAN, FREY V. Method for preparing chlorine dioxide gas. U. S. patent 2,533,842. Filed May 16, 1946. Issued Dec. 12, 1950. 6 claims. Assigned to Kymin Osakeyhtiö-Kymmene Aktiebolag. [Cl. 23-152]

A process for the production of chlorine dioxide comprises the contacting of sulfur dioxide with a chlorate-containing solid in the presence of sufficient water to form a paste, but insufficient to dissolve the chlorate; mechanical agitation is used to increase the amount of contact between the gas and the solid. E.G.S.

DISPENSING CONTAINERS

VIVIAN, GEORGE S. Containers. Canadian patent 469,465. Filed March 30, 1948. Issued Nov. 21, 1950. 7 claims.

A paperboard milk container incorporates a multilayer opening structure which includes an outer flap adapted to be pulled open to uncover an opening in the center layer; the inner layer is cut and scored in such a manner that when it is pulled through the opening, it forms a pouring spout. 6 figures. E.G.S.

FOLDING BOXES

ALLEN, WILLIAM H., and HALL, MAYNARD G. Egg carton. U. S. patent 2,533,340. Filed Jan. 24, 1947. Issued Dec. 12, 1950. 12 claims. Assigned to Empire Box Corporation. [Cl. 229-28]

A paperboard egg carton is described which can be divided transversely into two egg-carton sections, each holding six eggs in two rows of three. 15 figures. E.G.S.

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,535,056. Filed Oct. 22, 1947. Issued Dec. 26, 1950. 10 claims. [Cl. 229-34]

A knocked down carton or box can be set up to provide an extending flange around the base of the carton and the upper end of the lid. 12 figures. E.G.S.

TYRSECK, WALTER J. Carton. U. S. patent 2,533,070. Filed Oct. 26, 1949. Issued Dec. 5, 1950. 10 claims. Assigned to Robertson Paper Box Company Incorporated. [Cl. 229-14]

A shockproof or cushioned pasteboard carton is adapted for the packaging of bottles or similar articles. 5 figures. E.G.S.

FOLDING BOXES, SIFTPROOF

CHRISTENSSON, OD W. Packages. Canadian patent 469,625. Filed Oct. 19, 1948. Issued Nov. 28, 1950. 3 claims.

A cardboard carton is constructed in such a manner that when the outer flap structure is folded into a closed position, the inner liner will be folded to render the package siftproof to powdered or granular materials. 6 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

BURGESS, FRANK H. Method and machine for gluing and folding paper boxes. U. S. patent 2,532,479. Filed Jan. 8, 1947. Issued Dec. 5, 1950. 8 claims. [Cl. 93-49]

A method and apparatus are described for the erection and gluing of paperboard containers. 24 figures. E.G.S.

CLARK, CONVERSE V. Web former and cutter for satchel bottom paper bags. U. S. patent 2,533,433. Filed June 8, 1945. Issued Dec. 12, 1950. 3 claims. Assigned to The Chase Bag Company. [Cl. 93-19]

A web former and cutter is designed for use in the manufacture of satchel-bottom paper bags. The usual variation in the distance between thumb cuts from one bag to the next is eliminated by the location of the thumb-cut knife at the back end of the machine, adjacent to the cutoff knife. 13 figures. E.G.S.

LANDGRAF, STEPHEN V. Method and apparatus for producing resin impregnated sheets. U. S. patent 2,528,152. Filed June 24, 1947. Issued Oct. 31, 1950. 8 claims. Assigned to United States Rubber Company. [Cl. 154-37]

A method and apparatus are adapted for the continuous production of a resin-impregnated sheet material (e.g., paper or fabric) which has a hard, mar-resistant outer surface. 4 figures. E.G.S.

STAUDE, EDWIN G. Method and mechanism for folding paper boxes. U. S. patent 2,532,522. Filed Dec. 28, 1946. Issued Dec. 5, 1950. 9 claims. Assigned to The Sperry Corporation. [Cl. 93-49]

An apparatus is described for the infolding of paper boxes like that covered in U. S. patent 644,857, issued March 6, 1900, in which tabs on diagonal crease lines on adjacent side panels may be reversed or folded back onto the exterior of the infolded side panels. 11 figures. E.G.S.

VERGOBBI, JOHN G. Lined container forming machine. U. S. patent 2,533,642. Filed Jan. 19, 1949. Issued Dec. 12, 1950. 3 claims. Assigned to Pneumatic Scale Corporation, Limited. [Cl. 93-36.01]

A container-forming machine embodies one or more forming blocks around which the liner and the carton are formed in successive operations; a provision is made for maintaining the bottom folded portions of the liner in an operative position while the carton is being formed around it. 6 figures. E.G.S.

MACHINERY—DRYERS

HAYWARD, RALPH A. Apparatus for drying paper, paperboard, pulp, and the like. U. S. patent 2,532,910. Filed Sept. 2, 1947. Issued Dec. 5, 1950. 5 claims. Assigned to Kalamazoo Vegetable Parchment Company. [Cl. 34-68]

The number of drier rolls in a paper machine is reduced by the inclusion of a vacuum roll after a suitable number of initial heating rolls. The moisture in the wet web is heated to 212°F. or above on the heated rolls and is then removed on the vacuum roll by displacement with air. After leaving the vacuum roll, the web may be passed through pressure rolls if desired. 6 figures. E.G.S.

MACHINERY—PACKAGING MACHINERY

BRYANS, HARRY C. Roll crimping machine. U. S. patent

2,533,993. Filed Nov. 8, 1949. Issued Dec. 12, 1950. 6 claims. Assigned to Canadian International Paper Company. [Cl. 93-5]

A crimping machine is particularly suitable for crimping the ends of the wrappers on large rolls of paper such as newsprint; the newsprint roll is supported on a pair of driven carrier rolls, one of which is fitted with a pair of adjustably mounted crimping assemblies. 7 figures. E.G.S.

KINDSETH, HAROLD V. Machines for compacting material in containers. Canadian patent 469,024. Filed April 15, 1946. Issued Oct. 31, 1950. 2 claims. Assigned to Bemis Bro. Bag Company.

A machine is adapted for the settling and compacting of materials, such as flour and other finely ground or pulverized materials, in flexible-walled containers, bags, and the like, prior to closing and sealing the open tops of the containers. 7 figures. E.G.S.

MACHINERY—PAPER MACHINE

GOODWILLIE, JOHN E. Sealed wet end for paper machines. U. S. patent 2,535,732. Filed Feb. 13, 1946. Issued Dec. 26, 1950. 6 claims. Assigned to Beloit Iron Works. [Cl. 92-43]

This is similar to Canadian patent 447,123; *cf.* B.I.P.C. 18:568. E.G.S.

MACHINERY—PRESSES

HRUBECKY, GEORGE F. Slice roll assembly for paper machine presses. U. S. patent 2,535,738. Filed Jan. 30, 1947. Issued Dec. 26, 1950. 10 claims. Assigned to Beloit Iron Works. [Cl. 92-49]

A slice roller is rotatably mounted immediately in advance of the nip of a paper machine press to prevent water extracted from the press from running back along the felt and creating water marks or streaks, and to press sufficiently hard upon the felt to eliminate picking of the sheet by the felt when the sheet is separated from the felt. 4 figures. E.G.S.

MACHINERY—REFINERS

ROBERSON, CYRUS E. Hydraulic seal for pulp refining mills. U. S. patent 2,533,199. Filed Jan. 9, 1947. Issued Dec. 5, 1950. 2 claims. Assigned to The Noble & Wood Machine Company. [Cl. 286-9]

A pulp refiner incorporates a sealing structure which is interposed between the rotor and stator elements of the machine and which is designed to prevent the leakage of stock at that point. 2 figures. E.G.S.

MACHINERY—SCREENS

LINDBLAD, KARL R. Rotary screening drum. U. S. patent 2,532,415. Filed April 19, 1946. Issued Dec. 5, 1950. 4 claims. Assigned to Svenska Cellulosa Aktiebolaget. [Cl. 92-36]

This is similar to Canadian patent 440,963; *cf.* B.I.P.C. 17: 534. E.G.S.

PERSSON, ALEF R., and KARLSTRÖM, KARL J. Methods and devices for sieving fibrous suspensions. Canadian patent 469,943. Filed Sept. 19, 1947. Issued Dec. 12, 1950. 11 claims.

A pulp screen incorporates a series of low-pressure (i.e., less than about

7 p.s.i.) water jets which supply the water necessary for screening and also cause a mild, effective stirring action so that rectilinear flow is substantially prevented. 3 figures. E.G.S.

VITALIUS, JOSEF V., and KLYKKEN, NILS. Filter drum and shielding shoe. U. S. patent 2,534,563. Filed Feb. 14, 1948. Issued Dec. 19, 1950. 4 claims. Assigned to Aktiebolaget Kamyr. [Cl. 210-202]

A rotary pulp screen incorporates a stationary shield or baffle plate which serves to shield a portion of the inner surface of the screen shell at the portion of the shell where the web of material is removed from the outer face of the screen. A pressure-actuated element serves to hold the shield against the screen with the required bearing and sealing pressure. 4 figures. E.G.S.

MACHINERY—SLITTERS AND WINDERS

DRENT, HENDRIK H. Paper rolls winding machine. Canadian patent 469,629. Filed May 16, 1946. Issued Nov. 28, 1950. 11 claims.

A winder for rolls of greaseproof, wallpaper, wrapping paper, and the like incorporates a cutting mechanism which is actuated to sever the moving paper web after a predetermined length of web has passed to a windup roll. 5 figures. E.G.S.

MACHINERY—TUBE MAKING MACHINE

HENSLER, ELMER G. Method of making paper tubes. U. S. patent 2,532,494. Filed Nov. 23, 1946. Issued Dec. 5, 1950. 1 claim. Assigned to McGraw Electric Company. [Cl. 92-66]

This corresponds to Canadian patent 459,650; *cf.* B.I.P.C. 20: 137. E.G.S.

MACHINERY—VORTEX-TYPE DIRT SEPARATOR

BERGÈS, ANDRÉ C. Vortex type separator for paper pulp. U. S. patent 2,532,885. Filed April 9, 1948. Issued Dec. 5, 1950. 11 claims. [Cl. 92-28]

This corresponds to Canadian patent 458,271; *cf.* B.I.P.C. 19: 895. E.G.S.

METERS AND RECORDERS

ANDERSON, WILMER C. Apparatus for measuring and controlling moisture content or the like. U. S. patent 2,535,027. Filed March 27, 1947. Issued Dec. 26, 1950. 15 claims. Assigned to Deering Milliken Research Trust. [Cl. 34-52]

An apparatus is adapted for controlling the moisture content of a paper web in response to changes in the capacitance and equivalent resistance of a condenser, which result from the passage of the web between the plates of the condenser. 4 figures. E.G.S.

ANDERSON, WILMER C. Moisture determination. U. S. patent 2,535,026. Filed Feb. 21, 1947. Issued Dec. 26, 1950. 7 claims. Assigned to Deering Milliken Research Trust. [Cl. 175-183]

The moisture content of a continuous web of material (e.g., textiles,

paper, wood, grain, or the like) is determined as a function of the change in capacitance and equivalent series resistance of a condenser as the web passes between the plates of the condenser. 4 figures. E.G.S.

PACKAGING—OPENERS

WILL, THEODORE A. Opening means for cigarette wrappers. U. S. patent 2,533,255. Filed July 20, 1946. Issued Dec. 12, 1950. 2 claims. [Cl. 229-51]

A tear strip is adapted for use in connection with cigarette wrappers. A series of indentations or perforations are provided which extend through all the layers of the wrapper; the perforations are arranged in register with the tear strip, so that the adhesive which is employed to fasten the tear strip in place will fill the perforations and form a tearing medium which is carried by the strip and which is useful in cutting through the bridged portions of the wrapper between the indentations or perforations. 11 figures. E.G.S.

PAPER—COATED

BARRETT, WILLIAM H., and ASDELL, BERNARD K. Process for coating paper. U. S. patent 2,534,848. Filed Nov. 15, 1946. Issued Dec. 19, 1950. 2 claims. Assigned to Minnesota and Ontario Paper Company. [Cl. 117-111]

A process of applying smooth films of a high-solids content (in excess of 60%) coating composition to a moving paper web with a moisture content of less than 10% comprises the steps of bringing the moving web into heat exchange with a drier drum; applying the coating material to an applicator roll; spreading the coating on the applicator roll to a smooth film and removing a predetermined portion of the coating composition with a doctor roll; applying the removed portion of coating material to a second applicator roll and smoothing the coating onto its surface; transferring the smooth film on the second applicator roll to the heated paper web; and applying the first-mentioned smooth film over the film applied to the paper web before the latter film is dry. This process is adapted for use in conjunction with the apparatus described in U. S. patent 2,416,789; *cf.* B.I.P.C. 17:457-8. 4 figures. E.G.S.

TAYLOR, WILLIAM P. Apparatus for coating paper. U. S. patent 2,534,320. Filed May 16, 1946. Issued Dec. 19, 1950. 3 claims. Assigned to The Champion Paper and Fibre Company. [Cl. 91-53]

An apparatus is adapted for the application of coating compositions to paper webs in layers of such thickness, uniformity, smoothness, and continuity as to constitute a suitable base for high-grade printing. Coatings of normal or unusually high solids content can be utilized. 5 figures. E.G.S.

TAYLOR, WILLIAM P. Coating method and apparatus. U. S. patent 2,534,321. Filed May 16, 1946. Issued Dec. 19, 1950. 8 claims. Assigned to The Champion Paper and Fibre Company. [Cl. 117-111]

A coating apparatus incorporates a doctor blade which is held in such a manner that it indents a rubber carrier surface slightly as the latter passes under the blade; the moving paper web is caused to adhere to the carrier surface where it is carried past the doctor blade. The degree of ad-

hesion required is such that the paper will strongly resist any forces tending to cause it to slide along the surface but will readily part from the surface when pulled away from the carrier. 4 figures. E.G.S.

PAPER AS A TEXTILE MATERIAL

KITCHEN, HARRY D. Method of making paper yarn. U. S. patent 2,532,923. Filed Jan. 24, 1949. Issued Dec. 5, 1950. 9 claims. Assigned to Sackner Products, Inc. [Cl. 57-165]

A method is described for the production of a variegated paper yarn from a single ribbon or strip of paper. 9 figures. E.G.S.

PAPER SIZING

DI MAIO, VINCENT. Methods of producing sols. U. S. patent 2,515,949. Filed Sept. 29, 1947. Issued July 18, 1950. 18 claims. Assigned to Monsanto Chemical Company. [Cl. 252-317]

A method of preparing a relatively stable, alkaline-reacting organo-aquasol (the organic substance may be ethanol, 2-propanol, or acetone) containing silica comprises the formation of a colloidal solution (pH 9.0-10.0) by the admixture of suitable proportions of a dilute sodium hydroxide solution and an acid-reacting, silica-containing organo-aquasol. The caustic solution contains 0.025-0.15 mole/liter of sodium hydroxide and the acid-reacting sol has a pH of 2.0-4.0. The product is useful in increasing the strength of cotton yarn, paper, and the like. E.G.S.

PAPER SPECIALTIES

BLETZINGER, JOHN C., and SAGER, KARL E. Tampons and tampon applicator assembling methods. Canadian patent 469,555. Filed Aug. 18, 1949. Issued Nov. 21, 1950. 8 claims. Assigned to International Cellucotton Products Company.

A method is described for handling the drawstring of a tampon to facilitate its introduction into a tubular paper applicator, usually as a part of the operation of assembling the tampon with the applicator. 19 figures. E.G.S.

BRADY, CHARLES V., and OTTINGER, AUGUST F. Helically-seamed labeled fabric tubing. U. S. patent 2,534,755. Filed Jan. 17, 1948. Issued Dec. 19, 1950. 2 claims. Assigned to Bemis Bro. Bag Company. [Cl. 138-53]

A helically seamed fabric tubing is provided with a paper label which consists of a continuous helical band encircling the tubing. 3 figures. E.G.S.

FIERO, GEORGE W., SEELAND, HOWARD F., and BATT, GEORGE H. Insecticidal paper-coating compositions. U. S. patent 2,534,008. Filed July 10, 1947. Issued Dec. 12, 1950. 1 claim. Assigned to Standard Oil Development Company. [Cl. 106-15]

A nonalkaline, insecticidal, paper coating composition consists of the following ingredients: 20 parts of dichlorodiphenyltrichloroethane (DDT), 19 parts of clay, 2.5 parts of a suspending and wetting agent, 0.2 part of octyl alcohol, 8.8 parts of chlorinated starch solution, and 50 parts of water (all parts by weight). E.G.S.

FROST, FREDERICK H. Paper base planographic printing plate. U. S. patent 2,534,588. Filed July 14, 1947. Issued Dec. 19, 1950. 15 claims. Assigned to S. D. Warren Company. [Cl. 101-149.2]

A planographic printing plate comprises a wet-strength paper base which is coated with a composition consisting of a finely divided filler dispersed in a hydrophilic colloid adhesive. The surface of the coating has planographic printing properties which have been improved by rubbing in the hard, dry state; the rubbed surface is less penetrable by ink than the unrubbed surface. E.G.S.

GURWICK, IRVING. Methods of surface coating tissue paper with thermoplastic resins. Canadian patent 469,806. Filed April 10, 1944. Issued Dec. 5, 1950. 24 claims.

A porous paper, such as tissue or filter paper, is coated with a thermoresponsive resin (e.g., a vinyl copolymer) in the manufacture of tea bags. 14 figures. E.G.S.

HEYWOOD, VINCENT E. Envelope. U. S. patent 2,535,537. Filed April 25, 1947. Issued Dec. 26, 1950. 1 claim. Assigned to United States Envelope Company. [Cl. 229-80]

A duplex, church-collection envelope is provided with a clean-tearing closure flap. 4 figures. E.G.S.

NORDEN, JESSE. Method of forming one-piece paper containers. U. S. patent 2,534,052. Filed June 24, 1948. Issued Dec. 12, 1950. 4 claims. [Cl. 93-36; changed to 93-60]

A paper milk container is constructed by subjecting a rectangular sheet of paraffin-impregnated paper to double folding in two directions in such a manner that the original sheet is contracted into a flat form which incorporates a multilayer base with a number of flaps extending therefrom; the flaps are subsequently deflected upwardly to form the body, neck, and lip portions of the container. 16 figures. E.G.S.

NUFFER, JOSEPH H. Dust collecting bag for suction cleaners. U. S. patent 2,532,933. Filed June 18, 1947. Issued Dec. 5, 1950. 1 claim. Assigned to Air-Way Electric Appliance Corporation. [Cl. 183-37]

A suction cleaner employs a disposable, dust-collecting, porous paper bag which can be mounted or removed without the use of special tools or appliances. 3 figures. E.G.S.

SCHORGER, ARLIE W. Stereotype mat. U. S. patent 2,533,145. Filed April 13, 1948. Issued Dec. 5, 1950. 6 claims. Assigned to Burgess Cellulose Company. [Cl. 22-5.5]

A stereotype mat consists of interbonded, felted cellulose fibers and a water-insoluble cellulose hydroxyalkyl ether from ethyl to propyl inclusive; the proportion of the ether is such that there are 0.25-1.5 hydroxyalkyl radicals to each unit of cellulose. E.G.S.

SCHUR, MILTON O., and LEVY, ROBERT M. Cigarette paper and processes. Canadian patent 470,020. Filed June 20, 1947. Issued Dec. 12, 1950. 13 claims. Assigned to Ecusta Paper Corporation.

A process for improving the ashing properties of cigarette paper comprises the addition of 2.5% of caustic soda (based on the weight of pulp) to the beaten pulp in the machine stock chest and the subsequent partial neutralization of the caustic soda by the addition of 1.25% of phosphoric acid (based on the weight of pulp). The caustic soda improves the tendency of the paper ash to cling to the tobacco, and the phosphoric acid serves to reduce the size of the flakes. E.G.S.

SLIFKIN, SAM C., and COFFMAN, JOE W. Diazotype transfer films. Canadian patent 469,857. Filed Feb. 11, 1948. Issued Dec. 5, 1950. 4 claims. Assigned to General Aniline & Film Corporation.

A diazotype transfer film comprises a plastic film (e.g., cellulose acetate, butyrate, or proprionate) which is sensitized on one side with a diazotype layer containing a light-sensitive diazo compound of a substituted *p*-phenylenediamine and an azo coupling component; the unsensitized surface of the film is affixed to a porous, absorbent paper base with hydrolyzed starch or dextrin. 1 figure. E.G.S.

SPENCER, PERCY L. Receptacles. Canadian patent 469,907. Filed Oct. 31, 1947. Issued Dec. 5, 1950. 2 claims. Assigned to Raytheon Manufacturing Company.

This corresponds to U. S. patent 2,528,251; *cf.* B.I.P.C. 21: 293. E.G.S.

TRILLICH, BERTRAM L. Self-sealing wrapping paper. Canadian patent 470,046. Filed Nov. 23, 1948. Issued Dec. 12, 1950. 9 claims. Assigned to The Munising Paper Company.

A self-sealing wrapping paper consists of a flexible, calendered paper sheet, one surface of which is coated with a flexible wax film (e.g., paraffin wax, beeswax, montan wax, carnauba wax, and the like) and the other with a film or coating of a cohesive, substantially nonadhesive rubber, such as would be deposited from a dried coating of unvulcanized natural rubber latex. 9 figures. E.G.S.

VANCE, WALTER S. Compound filter. U. S. patent 2,523,793. Filed Oct. 6, 1943. Issued Sept. 26, 1950. 7 claims. Assigned to Bendix Aviation Corporation (Delaware). [Cl. 210-184]

An edge-filtration filter is adapted for the elimination of oil or lubricant from the steam condensate which is discharged from steam engines or turbines. The filter consists of a number of hollow, cylindrical elements which are arranged parallel to one another; each element comprises a stack or pack of crepe-paper layers in face-to-face contact and in register with one another; a central aperture is provided through the series, one end of which is closed. The crepe paper is impregnated with a water-soluble phenolic resin which has been polymerized to render it water insoluble; the treated paper is resistant to water and oil. 5 figures. E.G.S.

VAUGHAN, THOMAS H., and CUTTING, ELMER J. Impregnated paper. Canadian patent 469,889. Filed April 9, 1947. Issued Dec. 5, 1950. 6 claims. Assigned to Plywoods-Plastics Corporation.

An adhesive paper for laminated products comprises a porous paper which is impregnated with 30-60% by weight of a phenol-formaldehyde resin having a dominant phenol content (as obtained by mixing 400-600 pounds of

phenol with 200-400 pounds of 37% U.S.P. formaldehyde), and with a second resin which has a predominant formaldehyde content (obtained by mixing 300-500 pounds of phenol with 900-1200 pounds of formaldehyde). Each resin is present in a dry, potentially reactive state. The resulting sheet contains 50-90% by weight of resin. E.G.S.

WATERFIELD, DONALD A. Coated abrasive articles and backings for such articles. U. S. patent 2,534,805. Filed March 10, 1947. Issued Dec. 19, 1950. 9 claims. Assigned to Behr-Manning Corporation. [Cl. 51-297]

A laminated backing is provided for use in the manufacture of coated abrasives. As an example, two plies of 65-pound rope Fourdrinier paper are laminated with the following adhesive composition: 26.2 pounds of glue, 7.3 pounds of dextrin, 44.2 pounds of filler (mechanically ground calcium carbonate having an average surface diameter of about 15μ), and 22.0 pounds of water. The lamination is made on conventional equipment at 170°F. The dry weight of the adhesive should be equivalent to 7 pounds per sandpaper ream. 3 figures. E.G.S.

WEBBER, CHARLES S., and TIMMER, WILLIAM F. Coated abrasive articles. U. S. patent 2,534,806. Filed July 18, 1947. Issued Dec. 19, 1950. 8 claims. Assigned to Behr-Manning Corporation. [Cl. 51-298]

The binder for a coated abrasive (e.g., sandpaper, emery cloth, and the like) incorporates an adhesive which is derived from potato starch, tapioca starch, cornstarch, and equivalent starches. 1 figure. E.G.S.

WORDINGHAM, MAURICE G. Garment hanger cover. U. S. patent 2,533,864. Filed Dec. 2, 1949. Issued Dec. 12, 1950. 7 claims. Assigned to Phoenix Products Co. [Cl. 223-98]

A paper cover for a wire garment hanger serves to prevent the hanger from leaving creases or hanger marks in the shoulders of a supported garment. The cover resists displacement from the hanger, even though it is held in place by only a few, relatively small patches of adhesive. 12 figures. E.G.S.

WORTHEN, STEPHEN V. Planographic printing plate and method of making same. U. S. patent 2,534,650. Filed June 26, 1950. Issued Dec. 19, 1950. 21 claims. Assigned to S. D. Warren Company. [Cl. 101-149.2]

A process for the production of a planographic printing plate comprises the application to the surface of a coating which consists essentially of a hydrophilic adhesive and a finely divided filler on a paper base, of an aqueous ammoniacal solution of a bivalent metal salt-ammonia complex (e.g., cuprammonium chloride); the metal, in the form of a water-soluble, water-stable, simple salt amounts to 15-42% of the dry weights of the filler and adhesive contents of the composition. E.G.S.

PHYSICAL TESTING—PULP—DISINTEGRATOR

LEVY, ROBERT M., and HARRISON, WARD D. Disintegrator of laboratory test size for wet disintegration of cellulosic pulp samples. U. S. patent 2,535,302. Filed May 3, 1944. Issued Dec. 26,

1950. 2 claims. Assigned to Ecusta Paper Corporation. [Cl. 92-22]

An apparatus is adapted for the wet disintegration of pulp samples in preparation for disperse viscosity determinations. The disintegrator comprises a closed chamber for holding the pulp and a relatively large volume of water, inlet and drain connections, and a rotary beater roll and a co-operating, resiliently mounted bedplate between which the pulp is disintegrated. After the beater roll has been rotated for about five minutes, the pulp is disintegrated and dispersed in the water to give a fluid, low-consistency pulp suspension which may be measured in a pipet. 6 figures. E.G.S.

SEMI-CHEMICAL PULPING PROCESS

HERITAGE, CLARK C. Cellulose fibres and processes for their production. Canadian patent 469,638. Filed May 19, 1947. Issued Nov. 28, 1950. 14 claims.

A semichemical pulping process involves the steps of steaming the raw wood fiber (e.g., aspen) at 100-175 p.s.i. for 1-11 minutes (the duration of treatment varies inversely with the steam pressure employed) and subjecting the steamed fiber to the action of a 0.1-3.75% aqueous sodium hydroxide solution for 0.5-2 hours at about the boiling temperature of the solution. The resulting pulp is suitable for use in the production of hardboard or paper. 5 figures. E.G.S.

HERITAGE, CLARK C. Cellulosic fibres and processes for their production. Canadian patent 469,639. Filed May 19, 1947. Issued Nov. 28, 1950. 29 claims.

A process for the production of pulp with improved papermaking properties comprises the steps of defibrating wood (e.g., aspen) to the form of ultimate fiber; subjecting the fiber to the action of steam at 100-175 p.s.i. for 1-11 minutes; subjecting the resulting steamed fiber to the action of a 0.1-3.75% aqueous sodium hydroxide solution at about the boiling point of the solution for 0.5-2 hours; subjecting the caustic-extracted fiber to the action of chlorine (10-35 parts by weight of chlorine per 100 parts of fiber); and extracting the chlorinated fiber with a 0.1-3.75% aqueous sodium hydroxide solution at about the boiling point of the solution. 5 figures. E.G.S.

HERITAGE, CLARK C. Cellulosic fibres and their production. Canadian patent 469,636. Filed May 19, 1947. Issued Nov. 28, 1950. 15 claims.

A semichemical pulping process is provided by which it is possible to avoid a loss of material as the result of excessive steaming of the wood fibers. The wood (e.g., aspenwood) is mechanically defibrated and subjected to the action of steam within the following limits of time and pressure: 1-11 minutes at 100 p.s.i., 1-6 minutes at 125 p.s.i., 1-3 minutes at 150 p.s.i., and 1-2 minutes at 175 p.s.i. 6 figures. E.G.S.

HERITAGE, CLARK C. Processes of making chemical products from wood. Canadian patent 469,637. Filed May 19, 1947. Issued Nov. 28, 1950. 18 claims.

A process for the recovery of high yields of water-soluble wood extractives with a minimum loss of substance by conversion to steam-volatile products comprises the steps of mechanically defibrating the wood (e.g., jack pine or aspenwood) and subsequently subjecting it to the action of steam

within the following limits of time and pressure: 11-45 minutes at 100 p.s.i., 3-12 minutes at 150 p.s.i., 1-4 minutes at 200 p.s.i., and 0.5-2 minutes at 250 p.s.i. 7 figures. E.G.S.

SHIPPING CONTAINERS

DE LA FORET, NORMAN F. Ventilated corrugated board container. U. S. patent 2,533,773. Filed July 16, 1949. Issued Dec. 12, 1950. 3 claims. Assigned to The Ottawa River Paper Company. [Cl. 229-6]

A ventilated corrugated board container is perforated in such a manner as to permit the exchange of air between the inside and outside of the container in an indirect manner, without appreciably weakening the walls of the container. 4 figures. E.G.S.

ROSS, ALFRED. Shipping case. U. S. patent 2,535,233. Filed March 24, 1948. Issued Dec. 26, 1950. 4 claims. Assigned to Allcraft Corrugated Corporation. [Cl. 206-7]

A combined hanger bar, tie bar, and strut for a corrugated shipping carton (e.g., for women's dresses) is formed of corrugated paperboard; the device possesses sufficient rigidity and strength to function as a hanger or suspension bar for the packed articles and also to reinforce the walls of the case against crushing or collapse. 19 figures. E.G.S.

SIMMS, HAROLD A. Ventilated shipping containers. Canadian patent 470,054. Filed May 27, 1947. Issued Dec. 12, 1950. 7 claims. Assigned to The Patent and Licensing Corporation of New York.

This corresponds to U. S. patent 2,511,550; *cf.* B.I.P.C. 20:840. E.G.S.

SULFITE WASTE LIQUOR

HOLZER, TIBOR. Method for the manufacture of molded articles. U. S. patent 2,534,908. Filed Aug. 28, 1946. Issued Dec. 19, 1950. 10 claims. [Cl. 106-123]

Sulfite waste liquor is utilized in the manufacture of a molded article. As an example, 500 parts by weight of shavings, corkpowder, etc. are steamed for about 20 minutes, admixed with 2000-4000 parts by weight of a 6° Bé. sulfite waste liquor, and stirred until a uniform dispersion is obtained. Then, at 20-40°C., 40-100 parts by weight of bone glue dissolved in water are added while the mixture is stirred vigorously. The resulting mixture is acidified with 50-90 parts of 1:1 hydrochloric acid until a pH of 3-4 is reached, and stirred for an additional 30 minutes. The liquid is decanted and the residual material is kneaded thoroughly; after the water is drained off, the fibrous mass is pressed at 160-250° under a pressure of 15-350 p.s.i. E.G.S.

WILEY, AVERILL J. Manufacture of fuel gas from pulp mill wastes. Canadian patent 470,097. Filed Sept. 13, 1947. Issued Dec. 12, 1950. 3 claims.

This is the same as U. S. patent 2,429,589; *cf.* B.I.P.C. 18: 215-6. E.G.S.

TALL OIL

KABERG, RUSSELL A., and HARRIS, JOHN S. Emulsifiable oil

concentrates of biological toxicants. U. S. patent 2,509,233. Filed Sept. 11, 1946. Issued May 30, 1950. 8 claims. Assigned to Monsanto Chemical Company. [Cl. 167-43]

A water-dispersible concentrate for forming stable, oil-in-water emulsions comprises an aromatic oil with a boiling range of 176-570°F.; an insecticide which is soluble in the aromatic oil; 3-10% by weight of an organic, oil-soluble, surface-active agent which is a neutral salt, is selected from the group consisting of sulfonates and sulfates, and has a Draves wetting time of less than 10.5 seconds in an aqueous solution containing 0.5% by weight of the surface-active agent; and 3-10% by weight of the non-resinous condensation product of one part of tall oil with 0.5-5 parts by weight of ethylene oxide. Substances such as plant hormones, fungicides, herbicides, and the like may be substituted for the insecticide as the active ingredient; the resulting oil-in-water emulsion may be applied by spraying, painting, or other means. E.G.S.

VINCENT, SHIRLEY M. Sand mold composition. U. S. patent 2,534,743. Filed Nov. 13, 1948. Issued Dec. 19, 1950. 5 claims. Assigned to Monsanto Chemical Company. [Cl. 22-188]

A sand core for use in the casting of metals comprises foundry sand and a reaction product of glycerin and the product obtained by reacting 500-3000 parts by weight of a tall oil vinyl ester with 100 parts by weight of maleic anhydride; the reaction product has an acid number of less than 100. The sand core is heat treated to cure the binder. E.G.S.

WASTE PAPER

WERTHEIM, JOSEPH, and DONALDSON, DONALD I. Recovery of bitumen and fibres from bituminized paper and like products. Canadian patent 469,990. Filed Oct. 25, 1947. Issued Dec. 12, 1950. 5 claims. Assigned to Australian Paper Manufacturers Limited.

A method is given for the recovery of bitumen and fibers from bituminized paper and similar products. As an example, a quantity of duplex kraft paper which is laminated with bitumen and which contains 38% bitumen on an airdry basis is disintegrated in a beater at a temperature above 20°C. The disintegrated stock is then screened through two screens—one of 0.025-inch slot width, followed by one of 0.10-inch slot width. The screened stock is then treated with caustic soda or soda ash to adjust its pH value to 10; the temperature is brought to 60°. Forty per cent of emulsified kerosene (based on the weight of bitumen present) is added to the mixture. The stock, at a consistency of 2-3%, is agitated for two hours, after which it is diluted to less than 1% consistency; all the bitumen floats to the top of the dilution vessel within a short period following slow agitation and mixing. E.G.S.

WET STRENGTH

NOVOTNY, EMIL E., VOGELSANG, GEORGE K., and NOVOTNY, ERNEST E. Hemi-formalization products of urea-formaldehyde resinous condensates. U. S. patent 2,512,671. Filed Aug. 8, 1945. Issued June 27, 1950. 5 claims. Assigned to The Borden Company. [Cl. 260-69]

The hemi-formalization products of urea-formaldehyde resinous condensates are suitable as modifying agents in starch adhesives for use in the manufacture of cardboard, corrugated board, V-board, paper boxes, and the

like. The modified adhesives impart increased strength and moisture resistance to the paper product. E.G.S.

WALTER, HENRY A. Aminoplasts containing silicon. U. S. patent 2,514,268. Filed May 23, 1947. Issued July 4, 1950. 3 claims. Assigned to Monsanto Chemical Company. [Cl. 260-17.3]

A substantially fireproof paper product comprises paper (e.g., kraft) impregnated with a silicon oxyamide-formaldehyde condensation product. The treated paper has a high wet strength and will not support combustion. E.G.S.

WOOD OPERATIONS

ACONLEY, JOHN. Choker hook and line. U. S. patent 2,533,905. Filed June 11, 1949. Issued Dec. 12, 1950. 2 claims. Assigned to Anglo-Canadian Pulp and Paper Mills Limited. [Cl. 294-74]

A steel choker hook is designed in such a manner that the maximum strength of the choker cable can be developed without placing undue localized strains on the hook or cable. The hook is adapted for use in logging and cargo-handling operations. 4 figures. E.G.S.

Book Review

HOPKIN & WILLIAMS LTD. *Research Laboratory Staff*. Organic reagents for organic analysis. [2d. ed.] Brooklyn, Chemical Publ. Co., 1950. 263 p.

This book gives, in carefully selected form, the major classes of organic compounds, a limited number of reagents useful for identification in each class, the preparation of derivatives from these reagents, and a list of melting points for the derivatives. The edition is greatly expanded from the original volume (167 to 250 pages), of which the greatest increase is found in the melting-point tables (55 to 110 pages). In the melting-point section the heterocyclic and hydrocarbon tables have been enlarged to the greatest extent. The alkaloid section has been deleted. In the section on reagents, *p*-thiocyanophenylhydrazine has been dropped, and seven new reagents added: 1,3-cyclohexanedione as a reagent for aldehydes, similar in its action to dimedone but less expensive; ethanolamine for esters of dicarboxylic acids; ethyl *p*-hydroxybenzoate and thiourea for alkyl halides; maleic anhydride for conjugated dienes, polycyclic aromatic hydrocarbons, and furan derivatives; tetrachlorophthalic anhydride for aromatic hydrocarbons, and 2,4,7-trinitrofluorenone for polycyclic aromatic hydrocarbons. The authors have made a very judicious selection from the many reagents available in this field and give only those with the optimum of desirable characteristics. As an example of the data, of 1500 possible derivatives for the 300 acids listed (with 5 reagents), melting points are given for 608, and about 8% of these figures have been checked by the authors' own preparations. These confirmed data, given in bold-face type, provide the reader with a feeling of confidence. This book should prove very valuable to the worker in organic chemistry who desires the most satisfactory derivatives for a given organic compound and relatively simple methods for their preparation. JOHN W. GREEN

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